The Canadian Medical Association Journal

Editor

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FOREWORD

THE advent of each New Year brings with it the pleasant duty of wishing the members of the Canadian Medical Association, on behalf of the Editorial Board of the *Journal*, the Compliments of the Season. Coupled with our good wishes, we desire to express the hope that the coming year will bring with it a greater measure of prosperity than did the last.

In spite of hard times, the *Journal* can report a successful year. Abundant material has been offered for publication, testifying to an increasing sense of the opportunities which the *Journal* offers for the presentation of Canadian work. It is not possible, on account of the expense and other considerations, to accept every manuscript that is offered, and, as a result, not a few papers have to be returned, not necessarily on their merits, or demerits, but because, perhaps, several dealing with the same topic, on the same or similar lines, are on hand at the same time. In such cases, publication, if indeed possible, must be unduly delayed. This is not an unmixed evil, for it enables the editors to present a journal that is better balanced and of greater variety. During the period, 1930-31, our issues were unusually large. This is explained by the fact that this was the time when we were presenting the papers of our English colleagues, read at Winnipeg, at the combined meeting of the British and Canadian Medical Associations. It was thought desirable to publish these, as, otherwise, they would not have been available to a large number of our readers. Now, however, we are back to more normal times.

We are pleased to have had the opportunity of publishing a number of papers of a research character and of considerable importance. There is a limit to what we can do in that direction, but we are desirous of publishing one such paper in each issue. Possibly the time may come when it will be possible to have a Canadian journal entirely devoted to research work.

In accordance with the practice of most journals now, no free reprints are being furnished of articles appearing in our columns—this on account of the heavy expense entailed thereby.

We are glad to note the increased interest being taken in the new Department of "Letters, Notes, and Queries." This column could be made most interesting and helpful as a forum for the exchange of ideas and the ventilation of the many problems and difficulties that are confronting the profession. Write for it.

Again, we are featuring a number of articles relating to the early medical history of Canada. We invite articles of this kind from the several provinces. In this way may be preserved for all time much material that would otherwise be lost. It might be possible, indeed, in the future, to build up from such articles a volume on Canadian medical history which would have distinct merits of its own. The material at hand is by no means exhausted.

A topic which is much to the fore today is what we call, for want of a better name, State Medicine. More and more, encroachments are being made by governments and lay organizations on the sphere of Medicine. It behoves us to be ready with constructive suggestions and criticisms, otherwise we shall eventually, as a profession, be forced into an undesirable and, perhaps, impossible, position. A committee of the Association is now studying this problem, and will, doubtless, welcome any information and suggestions that may be laid before it. The Provincial Associations, can, of course, do much themselves in the matter, but concerted action is alone possible through the national Association. The *Journal* has been publishing, and will continue to publish, articles bearing upon this most important matter, and invites correspondence. No other matter before the profession at the present time is so fraught with danger and so insistent for a settlement that will be equitable to all. Let us try and settle it, as far as our part is concerned, without more delay.

A.G.N.

The Blackader Lecture in Diseases of Children

WITH the publication of the first Blackader Lecture in Diseases of Children, it is opportune to review the incidents which led to the foundation of this Association Lectureship.

At the close of the War in 1919, the fortunes of the Association were at a low ebb. Still more had the Association Journal suffered almost to extinction. At the annual meeting in Halifax Doctor Blackader, then at an age when most men contemplate retirement, offered his services as Editor—an offer which was gladly accepted. Throughout the succeeding ten years, the duties, though voluntary, became more and more arduous. The reconstruction of the Journal became the obsession of the Editor who sacrificed every other interest to the completion of his self-imposed task.

At the annual meeting of 1929, Council passed the following resolution:—

> "Members of Council have learned with regret of the resignation of Doctor A. D. Blackader as Editor of the *Canadian Medical Association Journal*. During Dr. Blackader's tenure of office, covering a period of ten years, the quality of the *Journal*, the sphere of its influence, and the character of the service it has rendered, have all been a source of pride and satisfaction to every one interested in the welfare of the medical profession in the Dominion of Canada. As a tangible expression of deep and abiding appreciation of Doctor Blackader's efforts, as a mark of recognition, also, of his eighty-second birthday, and, finally, to signalize his pioneer and long-sustained interest in the field of diseases of children and his devotion to the highest ideals in medicine, it is recommended to Council that there be established in the Canadian Medical Association the Blackader Lecture in Diseases of Children."

We are happy to state that Doctor Blackader, as Editor Emeritus, continues to contribute regularly to the pages of the *Journal*.

A.T.B.

The Blackader Lecture

ON

SOME ASPECTS OF RICKETS*

By Edwards A. Park, M.D.,

Professor of Pædiatrics, Johns Hopkins University,

Baltimore

I AM fully conscious of the honour conferred on me in being chosen to inaugurate the Blackader Lectures before the Canadian Medical Association. I take delight at the opportunity to speak before you, but more particularly to pay this initial tribute to Doctor Blackader, that pioneer in pædiatrics in North America, distinguished physician, teacher, author and editor, that delightful host, firm friend, and ever courteous gentleman, whose generous thoughts and tireless zeal for the welfare of others and the cause which seemed to him right have called forth so splendid a testimonial of respect and devotion.

I shall not make the attempt to cover rickets, or even any main division of it, since the knowledge concerning the disease has completely outgrown the confines of a lecture. Accordingly, I shall discuss as briefly as possible four aspects of the disease which, though unrelated, have interested me personally.

Calcification Versus Bone Growth

As Pommer[1] originally pointed out, the ends of the various long bones are affected unequally in rickets, and the degree of involvement is in direct proportion to the rapidity of growth of the epiphyseal cartilage. Schmorl[2] says that rickets first develops at the costochondral junctions of the middle ribs, next at the lower

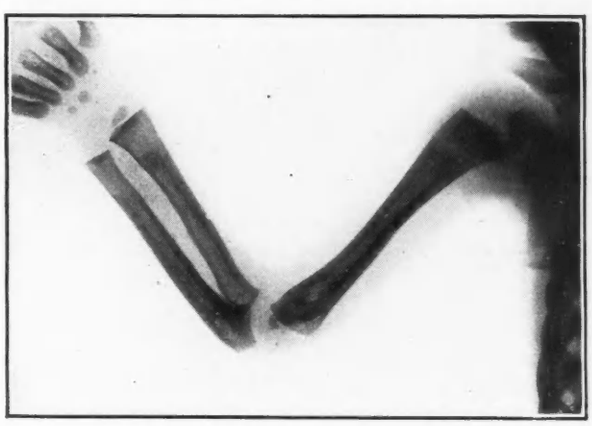

Fig. 1.—J. S. X-ray photograph of arm in a case of healed rickets. History unknown. The outlines of the shafts at the time the rickets began are clearly visible. The new bone formed under the influence of rickets has a ground-glass appearance as the result of a fine trabeculation. The demarcation between anti-rachitic and post-rachitic bone is so striking that the case affords an excellent illustration of the relative rates of growth. One can see that the magnitude of growth has been in the following order: upper end of humerus; lower end of ulna; lower end of radius; lower end of humerus; upper end of radius; upper end of ulna. The difference in the rate of growth at the lower end of ulna and at the lower end of radius is very slight. Growth at the lower end of the humerus takes place about half as fast as at the upper end and at the upper end of the radius about one-third as fast as at the lower end. Growth at the upper end of the ulna is very slow. Rickets should show itself at the ends of these bones in the order of the rates of growth.

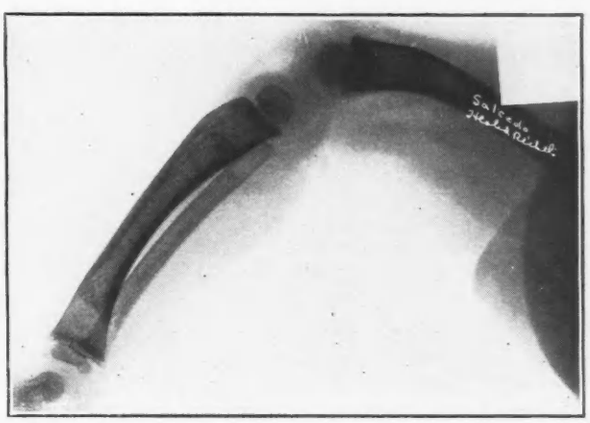

Fig. 2.—X-ray photograph of the leg of same child as in Fig. 1 (focal distance the same). One can see that the rate of growth of the lower end of the femur is greatest and the rates at the upper and lower ends of tibia and fibula are approximately the same but definitely less than that at the lower end of the femur. The bend backwards of the lower end of the femur at the junction of anti-rachitic and post-rachitic bone means that the epiphysis was dislocated backwards on the diaphysis at the time the rickets was at its height, producing an angular deformity which has mounted higher and higher in the bone with continued growth. If one will compare x-ray pictures of the arm and leg it is possible to see that the rate of growth at the lower end of the femur has been the fastest and at the ends of the tibia and fibula and the upper end of the humerus the rates of growth correspond. At the lower ends of the radius and ulna they are very slightly less.

* Delivered at the sixty-second annual meeting of the Canadian Medical Association, Vancouver, June, 1931.

end of the femur, next at the upper end of the humerus and at both ends of the tibia and fibula, and next at the lower ends of the radius and ulna, the upper end of the femur, the metatarsal and metacarpal bones and the phalanges. At the more slowly growing endochondral centres he found no disturbance until the disease elsewhere had reached an advanced development. Cases in which it is possible to measure the rates of growth at the ends of the various long bones by means of the x-ray confirm Schmorl's observations (Figs. 1, 2, 3, 4). Of the bones of the extremities, the lower end of the femur exhibits the most rapid growth, the upper end of the humerus and both ends of the tibia and fibula follow next, and then the lower ends of radius and ulna. Eliot and Souther[3] found that the lower end of the ulna grows slightly faster than the lower end of the radius. The lower end of the humerus and the upper end of the radius seem to grow about one-third to one-half as fast as the opposite ends. The upper end of the ulna grows most slowly of all. An appreciation of these facts has a practical importance.

The principle just discussed applies also to the shaft in rickets, namely, that at any point the degree of involvement is proportionate to the rate of osteoblastic growth. For that reason in searching the shaft for the characteristic osteoid formations of rickets one looks especially at the surfaces of the newly forming trabeculæ near the cartilage-shaft junction or at some point in the cortex which is being reinforced with new bone or in a callus.

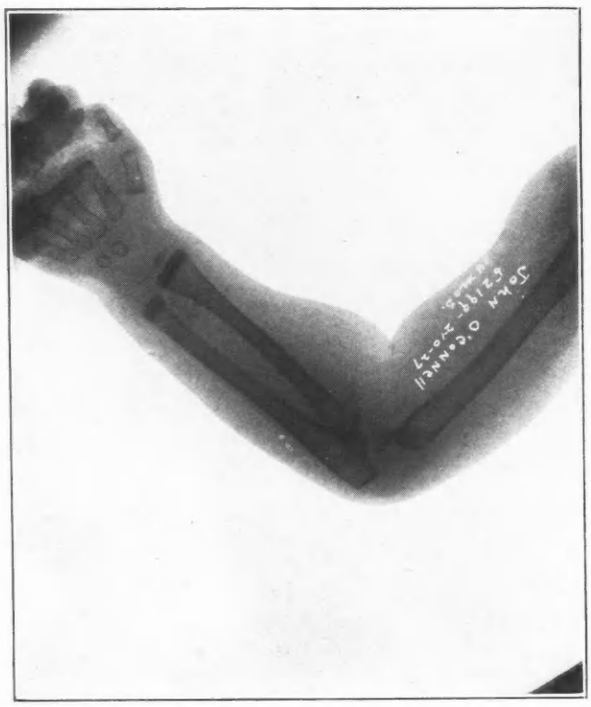

FIG. 3.—J. O., aged 14 months. X-ray photograph of arm after the administration of cod liver oil and phosphorus. As first pointed out by Phemister, inorganic phosphorus causes transverse bands to appear in the x-ray pictures of the bones. The phosphorus produces an intensely thick trabeculation which is responsible for the shadows. Only the parts of the bone in process of growth at the time of the phosphorus administration are affected. In this case the banding produced by the phosphorus gives a beautiful demonstration that the lower end of the ulna grows slightly faster than the lower end of the radius, that the lower end of the humerus and upper end of the radius grow much more slowly, and that the upper end of the ulna grows most slowly of all.

FIG. 4.—J. O. X-ray photograph of leg of same child as in Fig. 3 (focal distance the same). One can see that the rate of growth is fastest at the lower end of femur, less fast at the ends of the tibia and, by comparing leg and arm, that the growth at the ends of the tibia is slightly in excess of that at the lower ends of the radius and ulna.

The dependence of rickets on growth has been imperfectly appreciated. For rickets to develop; first, the skeleton must grow; secondly, lime salt deposition must be deficient in the new bone formed. Rickets cannot occur without growth, because lime salts cannot fail to deposit unless newly formed tissue exists for them to fail to deposit in. Rickets is present or absent according to the relationship which prevails between the rate of lime salt deposition and the rate of bone growth. If the latter

just corresponds to the former, complete calcification obtains. If the latter exceeds the former, rickets develops. If we express this relationship mathematically, as the easiest way in which to make the conception clear, then

$$\frac{\text{Rate of lime salt deposition}}{\text{Rate of bone growth}} = K_1$$

Since the rate of lime salt deposition is determined chiefly, if not entirely, by some, at present unknown, solubility product in the body fluids, which we represent by Ca x P, not because the expression is the correct one but because as the result of the teachings of Howland and Kramer[4] it is the one used practically, then

the rate of lime salt deposition (a) = Ca x P in the blood serum (b). If we now substitute (b) for (a), then

$$\frac{\text{Ca x P}}{\text{Rate of bone growth}} = K_2$$

The point is that, if the rate of bone growth (the denominator) increases, the solubility product, Ca x P (the numerator), must also increase. The product, Ca x P, therefore, cannot be thought of as having a constant value for the development or non-development of rickets, but must increase or decrease with the rate of bone growth.

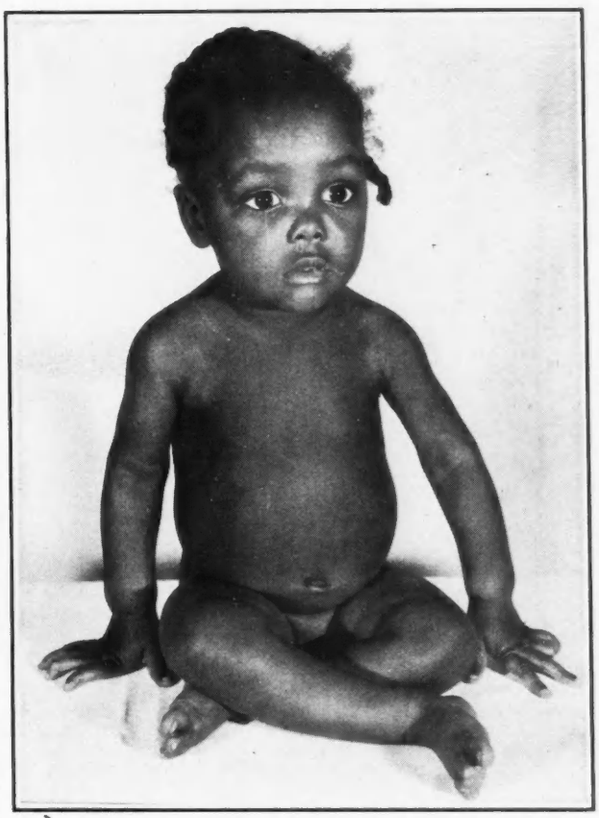

FIG. 5.—V. R., aged 16 months. Photograph illustrating the habitual sitting posture in severe rickets. The child leans slightly forward supporting the weight on outstretched fingers and palms. The legs are always crossed.

The truth of this idea is borne out by several sets of facts. The calcium remains at a more or less constant value of 10 + 1 mg. per 100 c.c. of serum throughout the life of the healthy individual, but the phosphorus varies with age. In the very young it has an average of 5 ± 0.5 mg.; in the adult, however, it is from 2 to 3.7 mg. Many adults should have rickets if the phosphorus level in the plasma or the calcium times phosphorus product were the sole determining factor. Hess[5] states that among 68 infants less than 4 months old, all of whom showed craniotabes, only one had a concentration of inorganic phosphorus less than 3.75 mg. per 100 c.c. of serum, and Wilson and Kramer,[6] in the study of 13 infants with craniotabes, varying in age from 2 to 8½ months, found that in no case was the blood phosphorus lower than 4.27 mg. and the product lower than 45. Hess reports a premature baby, 4½ months old, who developed well marked rickets when the serum calcium was 10.1 and the inorganic phosphorus 6.3 mg. (Ca x P = 61), and another premature infant, 3 months old, who showed progressive rickets in spite of the fact that the calcium of the blood was 13.6 mg. and the inorganic phosphorus 4.2 mg. (Ca x P = 57). Such data show that the concentrations of phosphorus and calcium required to prevent rickets in young babies, in particular young premature babies, may be greater than at subsequent life periods.

Proof of this conception, which seems to have entirely escaped attention, follows from the fact already stated, that in one and the same individual the degree of rickets at the cartilage-shaft junctions varies with the rate of growth. Suppose a baby has a serum calcium of 10 and a phosphorus of 3 mg. (Ca x P = 30) and the distribution of rickets is as follows:— costochondral junctions +++, lower end of femur +, lower end of humerus –, upper end of ulna –. Obviously the calcium and phosphorus concentrations in the blood have been sufficient to prevent the development of rickets at the slowly growing upper end of the ulna and the lower end of the humerus, but unable to prevent it at other fast growing cartilage-shaft junctions. The costochondral junctions, (corresponding to the premature baby) show rickets; the upper

end of the ulna (corresponding to the older child) fails to show rickets, though all are nourished by the same blood.

An appreciation that the growth factor causes the requirement of the skeleton for lime salts to vary removes the stumbling block which has annoyed students of rickets for some time. This stumbling block was introduced when Howland and Kramer[4] advanced the idea that the Ca x P product alone was a reliable criterion for the existence or non-existence of rickets and assigned for it arbitrary limits above which, 40, the disease could not occur and below which, 30, its occurrence was inevitable.

In the criticism of the validity of the calcium x phosphorus product as a means of determining rickets I do not wish to give the impression that the formula is not useful. It is most useful, but does not have an absolute value, and must not be considered by itself but always in conjunction with the age (rate of growth), and, indeed, all the other signs of rickets. If the patient is an infant or young child, a calcium-times phosphorus product under 30 means rickets and usually severe rickets. If the patient is an adult, the calcium x phosphorus product under 30 does not have special significance. If the patient is a prematurely born infant a calcium x phosphorus product of more than 40 does not preclude the possibility of rickets.

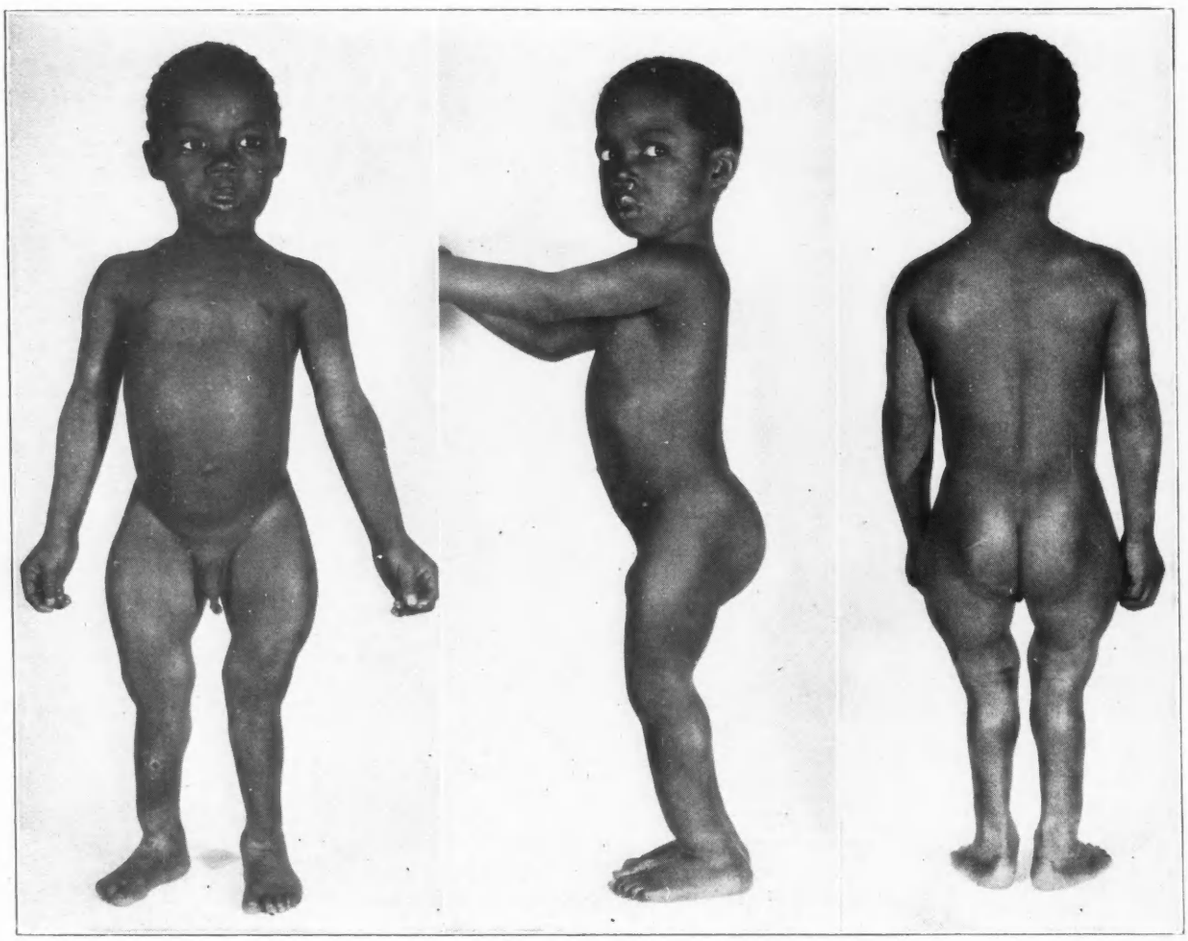

FIG. 6.—E. J., aged 5 years. Photograph illustrating the typical erect posture of child with rachitic deformities acquired from habitual sitting. Note the sabre-shin deformity just above the ankle and the bowing of the femur in the anterior and external directions. The posture is semi-crouching with buttocks protruding and compensatory lordosis. The deformities of the arms are not apparent.

In our turn we must give warning not to take the equation

$$\frac{\text{Ca x P}}{\text{Rate of bone growth}} = K_2$$

with too great literalness. The numerator, Ca x P, is used merely to symbolize the, at present unknown, equilibrium product in the

blood serum which determines lime salt deposition in bone and cartilage. Moreover, the equation leaves out of consideration the cartilage and bone cell which may be factors in the phenomenon of lime salt precipitation. Finally, the "rate of bone growth" is intangible and not susceptible of measurement. There is not the slightest doubt, however, that the equation expresses the truth, in indicating that the Ca x P product or the true solubility

THE ENDS OF THE LONG BONES LISTED ACCORDING TO SPEED OF GROWTH AND SUSCEPTIBILITY TO RICKETS

Middle ribs, costochondral junctions	++++++
Femur, lower end	+++++
Tibia, both ends	++++
Fibula, both ends	++++
Humerus, upper end	++++
Femur, upper end	++++
Ulna, lower end	+++
Radius, lower end	+++
Humerus, lower end	++
Radius upper end	++
Ulna, upper end	+

FIG. 7.—Photograph of the cut surface of the tibia split longitudinally in a case of severe rickets, showing the dislocation backwards of the lower epiphysis on diaphysis. The dislocation is made possible as the result of the stretching of the soft rachitic intermediate zone. As growth proceeds, the new bone which is generated by the lower epiphysis will take the direction of the latter with the result that the angular deformity will rise higher and higher in the leg. The photograph illustrates the pathological condition responsible for the sabre-shin deformity in its incipient stage.

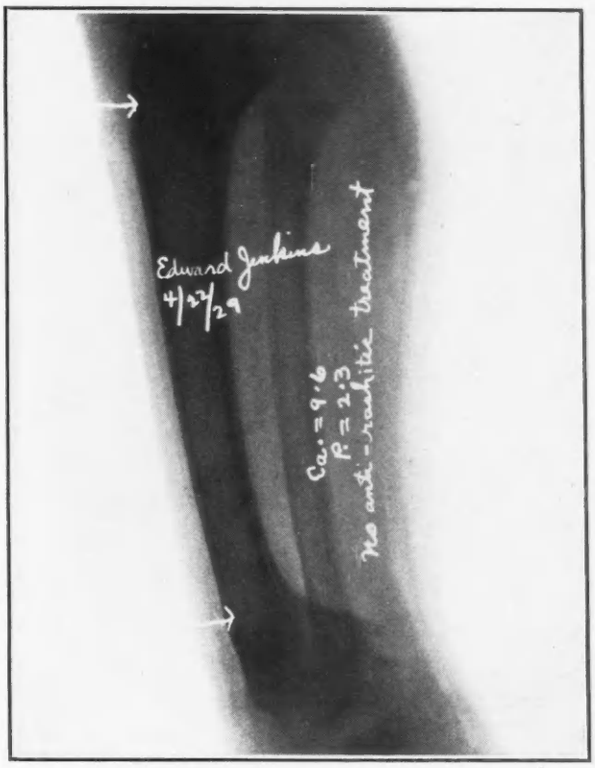

FIG. 8.—E. J., aged 3 years. The same child as in Fig. 6. X-ray photograph of leg showing origin of the sabre-shin deformity. The lower epiphysis of the tibia has been displaced backwards on the diaphysis. The deformity is situated just above the ankle.

product required for calcification of the skeleton is not fixed, as might be expected to be the case if the body were a collection of dead substances, but varies with the demands for growth. The equation is important from another point of view because it illustrates how the etiology of rickets has two sides, so to speak, and some factors operate by affecting calcification and others by influencing growth.

DEGREES OF RICKETS

We must grasp another fact in order to understand rickets, namely, that the disease manifests itself with every gradation, from one in which no lime salts deposit in the newly formed cartilage and bone to one in which only a small fraction is lacking. Rickets often goes on for months or years partially developed, for example, with 20 per cent of the optimal lime salt deposition occurring and 80 per cent not occurring, or with 60 per cent taking place and 40 per cent not taking place. When we discover by the x-ray film fragmentary lime salt deposits in the proliferative part of the epi-

physeal cartilage we often think that recovery is in progress, when really the condition has never changed and the lime salt deposits have been forming all along but have never been complete. If enlargements of the cartilage-shaft junctions persist in spite of treatment, how common it is to conclude that the treatment has been a total failure, whereas in reality it has changed a condition from one in which little lime salt was being deposited to one in which perhaps 70 per cent of that required was being attained. Probably a totally rachitic state, that is one in which no lime salts deposit anywhere does not ever occur. In all cases of rickets one ought to think of lime salt deposition, not as being absent but as being disturbed, in some cases slightly, in others severely. Probably in most cases of rickets the lime salt deposition fluctuates from time to time, depending on variations in the diet, chance exposure to ultra-violet light, the presence of complicating disease, etc. If the fluctuations are marked enough to express themselves in lines of lime salt deposit in the bone, we speak of "intermittent" or relapsing rickets.

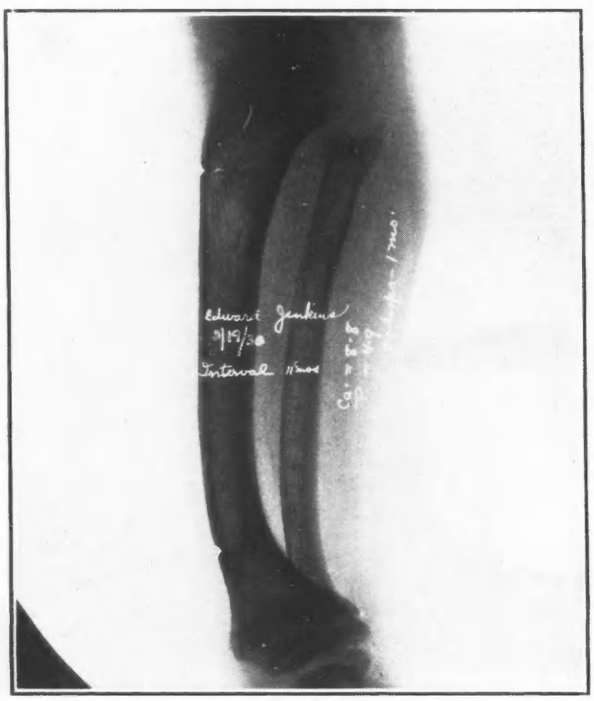

FIG. 9.—E. J. X-ray photograph of leg of same child as in Fig. 8 after an interval of 11 months. Note that this deformity is at higher level as the result of growth at the lower epiphysis. The deformity has really been pushed upwards and is now definitely above the ankle. The lower termination of the shaft of the tibia at the time when the rickets began is clearly outlined.

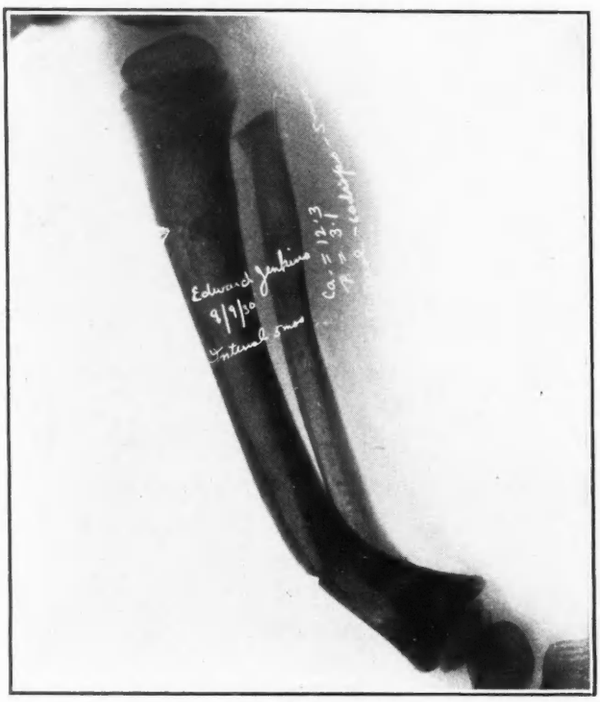

FIG. 10.—E. J. X-ray photograph of leg of same child as in Fig. 8 five months later than in Fig. 9. The sabre-shin deformity has mounted still higher as the result of continued growth at the lower epiphysis. The bending has increased. The lower end of the tibia at the time the rickets began is clearly outlined but now ends in a sharp point. Characteristic curved lines of stress extending downwards and backwards have made their appearance in the tibia below the deformity.

SITTING DEFORMITIES WITH PARTICULAR REFERENCE TO THE ORIGIN OF THE SABRE-SHIN

In extensive rickets every bone subjected to strain is affected to some extent and in the case of some bones, notably the long bones of the extremities and ribs, cranial vault and pelvis, the changes may be extreme. I wish to point out that the deformities caused by rickets follow different patterns at different age periods depending entirely on the time in the child's life when the rickets develops and flourishes. The reasons are, first, that stress and strain are differently applied, as the posture and activity change with increasing age, and, secondly, that rickets affects different parts of the skeleton at different ages according to the changing rates of growth. During the first six months the head is especially affected. In the next two and one-half years the cartilage-shaft junctions and the shafts vie in showing the greatest deformity. During the

third and fourth years the cartilage-shaft junctions and the shafts are equally involved, but after the fourth year the deformities of the cartilage-shaft junctions become less and less and those of the shaft more and more conspicuous. Indeed, from the fifth year on rickets bears an increasingly close resemblance to osteomalacia. According to Schmidt[7] the last cartilage-shaft junctions to show deformity are the costochondral junctions, because growth at them continues when it has virtually ended at the others.

I shall describe briefly the chief deformities of the arms and legs which are produced by sitting, and in a little more detail the origin of the sabre-shin deformity. The infant with severe rickets often sits all day long for months with legs crossed, tailor-fashion, leaning slightly forward and supporting the body on the outstretched hands (Fig. 5). As the result of this unvarying posture both arms and legs become deformed. The humerus bows outwards or outwards and forwards, slightly above the insertion of the deltoid; the curvatures, normal to the radius and ulna, are exaggerated and the lower epiphyses of the two bones are bent forwards and at the same time deflected either internally or externally according as the hands "toe in" or "toe out". The deformities of the arms are interesting and characteristic but do not have great practical importance. I have seen the bends of the radius and ulna disappear entirely within a year after the arms have been released from weight bearing. The bow in the humerus may be permanent, but is never conspicuous and does not interfere with the usefulness of the arm. The deformities of the leg, on the other hand, are most important. Though they may disappear, they often remain throughout life, are most disfiguring, and require orthopædic intervention. If one examines the legs in a typical case, one finds that the lower end of the femur, the lower end of the tibia, and, sometimes also, the upper end of the tibia are bent backwards or, perhaps, more often, backwards and inwards, and if one straightens out the legs and then returns them to their original position, one finds that the legs exactly fit into each other. When the child with typical sitting rachitic deformities finally stands he is forced to assume a characteristic semi-crouching position, with the buttocks thrust backwards and extreme lumbar lordosis (Fig. 6). If the rickets comes on after the child has learned to stand, the bends in the legs always occur sideways. The presence of the curvatures in the antero-posterior plane dates the rickets back to infancy.

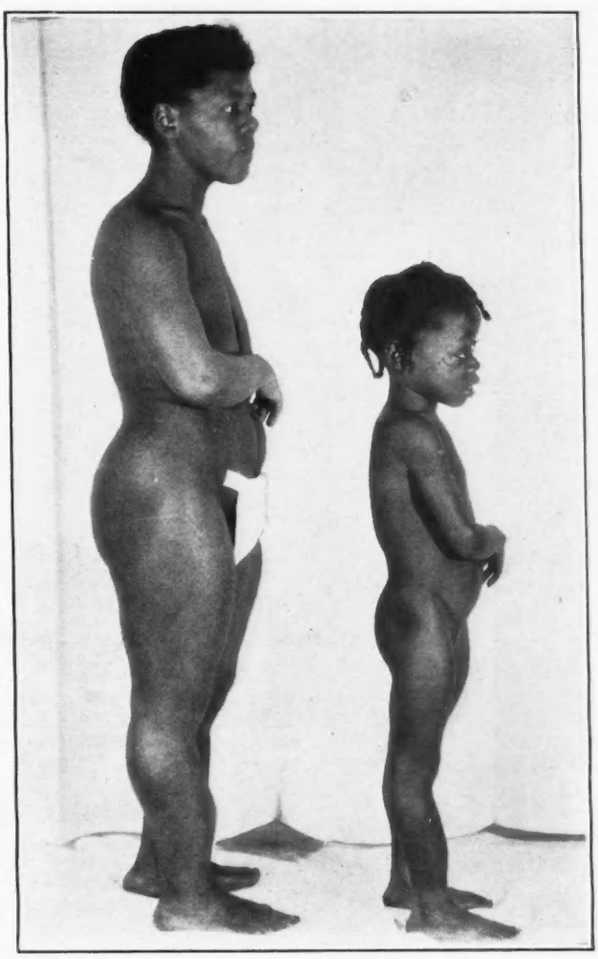

FIG. 11.—Typical sabre-shin deformity in mother and daughter. The daughter is seven years old. Note that the sabre-shin is higher in the case of the mother than the daughter. In both the anterior bowing of the femur can be recognized by the shape of the thigh. One knows from the characteristics of the deformities that the rickets was acquired in infancy from sitting.

The deformity of the tibia is the celebrated sabre-shin. Though the sabre-shin is usually a sitting deformity it can probably also be produced as the result of continued lying on the back with feet relaxed. The exact origin of the sabre-shin is interesting. It is produced by the pull of the tendo Achillis which carries the foot backwards. The displacement of the foot is made possible because the soft tissues composing the rachitic intermediate zone between the lower epiphysis and diaphysis of the tibia stretch and allow the epiphysis to bend backwards, so as to form an obtuse angle with the

shaft (Figs. 7, 8, 9, 10). Since the growth at the end of a long bone takes place entirely from the proliferative zone of the epiphyseal cartilage, the new bone generated at the lower end of the tibia comes entirely from the epiphysis and, therefore, takes the direction of the latter and perpetuates the obtuse angle. As growth continues, that is, as the epiphysis yields more and more shaft, the bend rises higher and higher until it reaches a point at or just above the lower third of the tibia. The reason that the bend in the sabre-shin never lies above the middle of the leg is that it begins always at the lower epiphyseo-diaphyseal junction. The sabre-shin deformity is a most common sight in the negro children playing on the Baltimore streets. In those who are very young the bend is just above the ankle, in those a year or two older it can be seen just above the shoetop, and in adults at or just above the junction of the middle and lower thirds of the leg (Fig. 11). Of course if the rickets continues after the child with these sitting deformities stands and walks, the bends characteristic of the rickets of later periods may be superimposed and the sitting deformities modified. For example, the characteristic anterior curvatures may be found in company with extreme knock-knees or bow-legs and it is often possible to recognize from the nature of the deformities that the rickets has continued to affect the rigidity of the skeleton after the sitting period is over. As time goes on, the sabre-tibia thins from side to side and thickens from before backwards. The thickening is due to new bone formation on the concave side. But the result is to intensify the sabre characteristics.

FIG. 12.—E. J., aged 3 years 4 months. X-ray photograph of arm showing deformity of the humerus acquired from sitting in severe rickets. The part of the humerus indicated by the arrow is the one at which later the bowing developed. Note that at this time no bowing exists and no fracture is present.

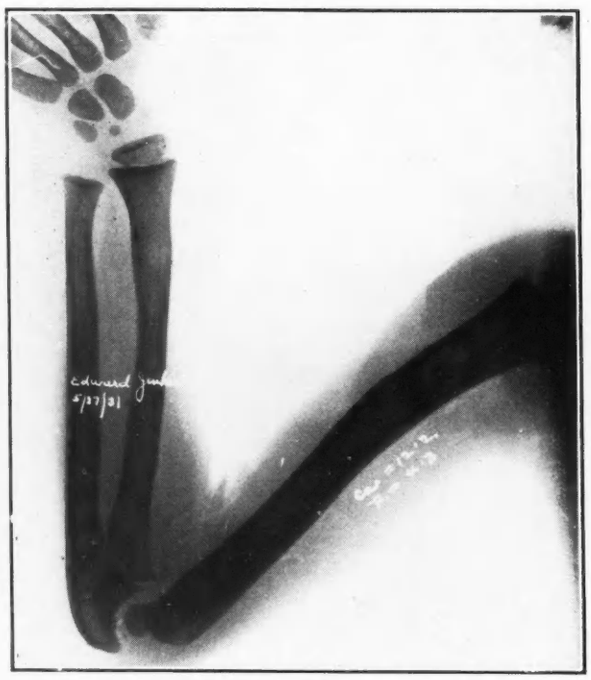

FIG. 13.—Photograph of the arm of the same child as in Fig. 12, one year and ten months later. The anterior (and external) bowing of humerus is evident. The bowing has occurred in the part of the bone indicated by arrow in Fig. 9, as has been determined by measurement. Inasmuch as growth at the upper end of the humerus occurs more rapidly than at the lower end, the point at which the bowing took place has been carried downwards, so that it now occupies a much lower position in the bone than when it first began. This deformity of the humerus has a totally different origin from that of the sabre-shin. As pointed out it results from yielding of the substance of the shaft and the point of yielding is probably determined by the pull of the deltoid, to the insertion of which it has a more or less constant relationship.

Shifting inwards on the diaphysis of the upper epiphysis of the humerus is very common also in rickets and the outward bend of the upper end of the humerus may be the product of the shift of the epiphysis and the yielding of the shaft above the deltoid.

The curvatures of the long bones in rickets have different origins. Many of them, like the sabre-shin and the backward bends at the lower end of the femur and upper end of the tibia, have their origin in displacements of the epiphysis on the diaphysis, but others are the result of simple bends in the substance of the

shaft or of fractures. The bowing of the humerus mentioned is an example of simple bending of the shaft (Figs. 12 and 13). If one takes x-ray pictures at frequent intervals of the humerus of the sitting rachitic child, one finds that the bend begins gradually a short distance above the insertion of the deltoid, probably as the result of the traction of that muscle, and progressively increases. Since the growth of the humerus at the upper epiphysis occurs twice as rapidly as at the lower, the bend gradually descends, but always remains the same distance above the insertion of the deltoid. Shifting inwards on the diaphysis of the upper epiphysis of the humerus is very common also in rickets and the outward bend of the upper end of the humerus may be the product of the shift of the epiphysis and the yielding of the shaft above the deltoid.

LIGHT IN RELATIONSHIP TO RICKETS*

The anti-rachitic radiations in sunlight and artificial light.—Sunlight consists of visible rays varying in length from 380 to 760 mμ (39 per cent); invisible infra-red rays from 760 to 50,000 mμ (60 per cent), those longer than 4,000 mμ amounting to only 1 per cent of the total; and invisible ultra-violet rays, from 380 to 290 mμ (1 per cent). The distribution of the energy in the solar spectrum is continuous.

The quartz mercury-vapour lamp gives off a percentage of infra-red (52 per cent) comparable to that in solar radiation, a much smaller percentage of visible light (20 to 33 per cent), and a wealth of ultra-violet light of wave lengths ranging between 310 and 255 mμ. Twenty-eight per cent of the total energy lies in the ultra-violet, and of this 6 per cent in wave lengths shorter than 290 mμ and hence beyond the limits of the solar spectrum. The spectrum of the quartz mercury-vapour lamp for practical purposes is discontinuous. Strong lines lie at 255, 297, 302 and 313 mμ, and weaker lines at 265, 270 and 310 mμ.

The carbon arc lamps give different kinds of emissions, according as certain metals, *e.g.*, cerium, fluorine, iron, nickel, cobalt, strontium, are incorporated in the carbons, either singly or in combinations. If iron is used, the radiations become strong in the ultra-violet between 230 and 320 mμ and, if strontium, in the near infra-red. The arc lamps whose carbons are combined with the idea of furnishing light of percentage composition similar to solar radiation are fairly successful in that regard. The wave lengths between 310 and 290 mμ are somewhat better represented than in sunlight, and those shorter than 290 do not possess much energy.

It is by means of the artificial sources of light used in combination with various filters that the rays active in rickets have been isolated. Hess and Anderson[8] found that wave lengths of 310 and 313 mμ are slightly effective, and Sonne and Rekling[9] that wave lengths of about 300 are very effective, those around 280 the most effective, and those around 260 mμ valueless. Window glass, which removes ultra-violet rays shorter than 315 mμ, deprives light of all its anti-rachitic power. The ultra-violet radiations active in rickets, then, lie between 315 and 260 mμ, corresponding in their range to the absorption spectrum of ergosterol.

The seasonal variation in ultra-violet light and in rickets. — The solar radiations shorter than 200 mμ convert the oxygen of the air into ozone, while those between 200 and 300 mμ change the ozone back again into oxygen. Through the action of the short ultra-violet radiations of the sun, a blanket of ozone, in continual process of formation and dissolution, is maintained in the outer layers of the atmosphere (Dobson,[10] Buisson[11]). This blanket acts as a great screen which is *totally* impermeable to radiations shorter than 290 mμ and through its exclusion of them makes life on the earth possible. To the anti-rachitic radiations between 290 and 315 mμ the blanket is only *partially* permeable, removing, as one might expect, the shorter more effectively than the longer. The movement of the earth on an oblique axis around the sun causes the sun's rays to impinge on the earth's atmosphere at different angles at different times of the year, and hence compels the rays to traverse a greater thickness of atmosphere at some periods than at others. The interposition of the atmosphere between the earth and the sun, and the movements of the earth around the sun, therefore, combine to

* In the lecture as delivered in Vancouver one of the main subjects was "The Age Incidence of Rickets". The presentation of the subject rested largely on the data which Eliot and Souther had collected in the course of the rickets investigation conducted by the United States Children's Bureau in New Haven, Connecticut, and Porto Rico. Inasmuch as Eliot and Souther have not yet published the results of their work, "Light in Relationship to Rickets" has been substituted.

cause a seasonal variation in both the quantity and quality of the anti-rachitic radiations which reach the earth's surface. For example, if the altitude of the sun is high, so that these anti-rachitic short radiations which can be partially absorbed strike the earth nearly perpendicularly, they encounter a minimal thickness of atmosphere, and the loss which they sustain is minimal. At the same time their density per unit area is maximal. On the other hand, if the altitude of the sun is low, so that the short radiations strike the earth obliquely, they traverse a greatly increased thickness of atmosphere and suffer a correspondingly great loss, and at the same time, as the result of their obliquity, their density per unit area is diminished. At Marseilles at midday, under the most favourable conditions of midsummer, Fabry and Buisson[12] found the shortest radiations to be 290 mμ; in winter at Davos, Switzerland, Dorno[13] determined the shortest rays to be 306 mμ. The energy of the short rays at the extreme end of the spectrum, whether in winter or in summer, is very small. According to Fabry and Buisson, the intensity of the summer radiation at 290 mμ is reduced from its passage through the atmosphere 2,000,000 times, and possesses only one-millionth the strength of the radiation at 315 mμ. According to Clark's[14] measurements at Baltimore, the total energy of the solar radiations between 290 and 315 mμ is 12 to 14 times greater in summer than in winter. One must think, then, of the solar spectrum outside the equatorial zone as undergoing a periodic expansion and retraction at the ultra-violet end, the expansion reaching its maximum at the summer solstice and the retraction at the winter solstice, or, to put the matter another way, of a winter period of famine in the anti-rachitic ultra-violet alternating with a summer period of plenty. The higher the latitude, the longer is this famine period, until at the polar regions it is complete for the greater part of the year. Conversely, the lower the latitude, the shorter the famine period, until as the equatorial zone is approached it ceases altogether, since the lowest altitude of the sun has become sufficient to ensure throughout the year adequate anti-rachitic radiation. By actual measurement Clark found that for Baltimore the anti-rachitic ultra-violet in the sunlight was least in December, began rapidly to increase in February, reached its height in late July or early August, and then rapidly declined to its lowest point in December. The quantity of anti-rachitic radiations in March and October corresponded. The reason that the peak in the anti-rachitic ultra-violet radiation occurred in late July and early August, instead of on June 21st, is that the blanket of ozone in the outer atmosphere remained unchanged until that time.

Tisdall and Brown,[15] at Toronto, have approached the problem experimentally by exposing rachitic rats to sunlight at different times of the year. They discovered that during December, January and February sunlight had a slight but definite anti-rachitic action; a sharp increase in activity occurred about February 15th, which reached the maximum in mid-summer, and an equally sharp decrease began about October 15th. The anti-rachitic power of sunlight in midsummer was eight times greater than in mid-winter. For the latitude and altitude of Toronto, the crucial inclination of the sun, so far as the anti-rachitic property of its light is concerned, seemed to be 35 degrees. Above this angle a pronounced anti-rachitic effect was produced, but below, only a very slight one.

All students of rickets are aware that the disease manifests itself with great frequency during the winter and early spring, and with much less frequency during the summer. This seasonal variation in rickets, which was first described by Kassowitz,[16] in 1884, has its explanation, as already indicated, in the seasonal variation in the ultra-violet radiations of the sun, which during the winter famine period in the northern part of the temperate zone are at best barely sufficient to afford protection, even if fully utilized under the best atmospheric conditions. Since it usually takes about two to three months for rickets to show itself clinically, the disease is found with the greatest frequency wherever the famine in ultra-violet light exists, in late February, March and April. The length of the rickets season, then, and the severity of the disease vary undoubtedly with the latitude, subject to modification by other factors which cannot be discussed here. According to Tisdall,[17] in Glasgow the sun is below 35 degrees for six months of the year,

in London five months, in Toronto and Boston four months, in Baltimore three months. The seasons for the development of rickets in the centres mentioned should be six, five, four and three months, respectively. In New Orleans at midday the sun is above 35 degrees throughout the year.

The diurnal variations in the anti-rachitic ultra-violet radiations show their effect only through summation in the seasonal. During the early morning and late afternoon, when the altitude of the sun is low, sunlight may not have any anti-rachitic activity. Naturally, the period of the day, when sunlight is effective is longer during summer than winter. For example, at Toronto, in June, the sun exerted an anti-rachitic effect from 7.55 a.m. to 4.30 p.m., but on March 6 this marked anti-rachitic action was present only from 10.37 a.m. to 2.18 p.m. (Tisdall and Brown,[18] Tisdall[19]). Clark[14] found that in Baltimore in winter there were no anti-rachitic rays in direct sunshine after 3.00 p.m.

Reflected sunshine and direct sunshine.—It is most important to realize that on meeting the atmosphere the solar radiations active in rickets are in part reflected and scattered, so that at the surface of the earth they are of two varieties, those coming indirectly from the sky, "sky shine" and those coming directly from the sun, "direct shine". An object placed on the shady side of the street is bathed only in sky shine. If placed on the sunny side under a long cylinder pointed at the sun, the sky shine is cut off and only direct rays reach it. Usually, one receives either sky shine and direct shine together, as when sitting in the sun, or sky shine alone, as when in the shade, but, exceptionally, one may receive only the direct rays, as when in a room in the sunlight at a distance from the open window. To receive all the sky shine, no obstruction can exist between the recipient and any part of the hemispherical dome of the sky; *e.g.*, a child seated in the shade against a wall receives only 50 per cent of the sky shine and, if at the back of a room, practically none. The walls of buildings in cities greatly reduce sky shine as well as direct sunshine.

Unfortunately, knowledge concerning sky shine is not so exact as one might wish. At Baltimore, in midsummer at noon on clear days, Clark[14] found that sky shine between 290 and 315 mμ possessed about two-thirds the value of the corresponding direct ultra-violet radiations; in early spring and fall it had about an equal value and in winter a greater value. The ultra-violet radiation in sky shine is far more constant than that from the direct sun shine. Since the reflected ultra-violet rays come from the drops of water in the atmosphere, their intensity may be increased by light clouds or haze. On a cloudy day, therefore, the total ultra-violet intensity of sky shine may be far greater than that of direct shine. On the other hand, if the clouds are dense the ultra-violet rays from sky shine, also, may be greatly reduced. Tisdall and Brown[20] estimated that the curative power of noon sky shine from January to May was two-thirds that of direct sunlight plus sky shine. When the altitude of the sun is high, the ultra-violet radiation of sky shine is greatest, and hence the value of sky shine is greatest in summer and at noon. But, because sky shine is reflected light, its ultra-violet rays are transmitted to the earth when the altitude of the sun is too low for the direct radiations to penetrate effectively. Hence, in the early morning and late afternoon the ultra-violet in sky shine may be greatly in excess of direct shine, as is the case in December. Sky shine is said not to tan but undoubtedly *can* produce tanning. It is the chief source of protection against rickets in parts of the world in which, relatively speaking, little sunlight exists, for example, England.

Ultra-violet radiations, both direct and indirect, may be reflected from favourable surfaces on the earth. For example, Earp[21] found that the ultra-violet light was greater in Denver in November, when the earth was covered with snow, than in September. Doubtless, in the polar regions the anti-rachitic ultra-violet radiation during the summer season is exceedingly weak, but it is present the entire twenty-four hours and its effectiveness is increased because of the continual reflection from the snow. The therapeutic ultra-violet radiations are undoubtedly reflected from the surfaces of water and sand of the seashore and desert regions.

Altitude.—Not only latitude but altitude is important with reference to the transmissibility of the anti-rachitic ultra-violet. The higher the altitude the thinner the covering of atmosphere which can absorb the short radiations. To show how altitude and latitude are interrelated, Tisdall and Brown's[22] comparison of

the anti-rachitic conditions at Denver and Toronto may be cited. These investigators computed that on account of the more southern latitude of Denver the sun should attain an angle of 35 degrees by February 8th instead of March 15th, as at Toronto, but because of the altitude of 5,300 feet of Denver the angle of inclination of the sun required for a pronounced anti-rachitic effect was reduced from 35 degrees to 29 degrees. At Denver, then, the theoretical rickets period begins on December 1st and ends on January 17th, whereas, in Toronto it begins on October 15th and ends on February 15th.

Dust and smoke.—Foreign particles in the air, such as dust and smoke, act as absorbents of ultra-violet light. The extent to which they obstruct the anti-rachitic radiations is not known, but is doubtless considerable.

Clothing.—Little of the anti-rachitic radiation is able to penetrate clothing material as was indicated by the study of Sambon[23] in 1907. According to Hess, the cotton and woollen stocking material worn by infants admits but a small fraction of ultra-violet light unless a very large dosage is used. Rayon material may permit the passage of anti-rachitic radiations.

Intensity versus time.—The therapeutic effect of ultra-violet light in rickets depends on an intensity factor and a time factor, though the product is not a constant. Under poorer conditions a long exposure may be the equivalent of a short one under good conditions. For example, Clark[14] has estimated that in Toronto a daily exposure of approximately twenty minutes to the noon sun in June is equivalent to three or four hours in January.

The area of skin exposed and pigmentation.—A surface area factor, doubtless, ought also to be included in considering the therapeutic effect of ultra-violet light in rickets. Huldschinsky[24] showed that exposure of an arm alone in rickets is sufficient to cause a general deposition of lime salts. Undoubtedly, the exposure of the entire body or a large part to ultra-violet radiation is more effective than the exposure of a small part. Nevertheless, the habitual exposure of a small part, for example, the face and hands, is the way in which protection is ordinarily attained.

The pigmentation of the skin which results from exposure to ultra-violet light is, according to Miescher,[25] nature's method of protecting the dermis. If all pigment is lacking, irradiation, if sufficiently intense and prolonged, will cause ulceration of the deeper layers. Miescher's studies indicate that the horny layer of the epidermis thickens under ultra-violet irradiation and that it possesses the property of absorbing ultra-violet rays. As Miescher puts it:—"The pigment layer is the sunshade for the dermis, as the horny layer is the sunshade for the epidermis. Apparently, the horny layer of the epidermis is a first line of defense against ultra-violet light, as against other injurious agents, and the pigment is a second. The mechanism which brings about tanning is unknown. Tanning is not essential in order that ultra-violet light have an anti-rachitic effect.

Radiation of the skin of the negro is curative of rickets in spite of the heavy pigmentation, a fact which indicates that the seat of action of ultra-violet light must be very superficial. According to Anderson and Macht,[26] ultra-violet light can penetrate the living skin of the rabbit a distance of 1 to 2 mm.

Window glass and its substitutes.—We have already mentioned that ordinary window glass removes anti-rachitic radiations. A variety of translucent substitutes have been developed. Tisdall and Brown,[27] by experiment, estimated that these glasses transmitted only 25 to 50 per cent of the anti-rachitic radiations. The glasses, however, have since been improved and now are said to transmit at least 50 per cent. The anti-rachitic effect of sky shine, except immediately adjacent to the glasses, Tisdall and Brown found, was almost negligible. The reason is that as one moves further and further from a window, the area of sky which can reflect through it becomes so reduced that the quantity of ultra-violet rays it can give off is only a minute fraction of the total. In order to obtain much benefit from rays through ordinary windows glazed with special glass, it is necessary to receive the direct rays of the sun. In the winter, when ultra-violet light is most needed, these glasses, for practical purposes, are almost useless.

The quantity of sunlight.—An interesting consideration is the relationship of the quantity of actual sunlight to rickets. Hess[5] finds that of New York, Paris, Berlin, Stockholm and London, New York has by far the greatest number of hours of actual sunshine, and London the

smallest. New York has approximately the same number of hours during February and March as has London during the months of June, July and August. As Hess points out, rickets develops during the winter in New York, whereas it undergoes cure in London during the summer. Glasgow, notorious for its rickets, has about the same number of hours of sunshine as London. A saving factor in cloudy parts of the world, such as England, must be the reflected ultra-violet light from the sky.

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SPONDYLOLISTHESIS*

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IN 1853, Kilian applied the term spondylolisthesis (σπόνδυλος , a vertebra, and ὀλισθήσις, a sliding forward), to a condition in which the fifth lumbar vertebra had slipped downward and forward on the first sacral segment. His term was so truly descriptive of what actually happens that it has remained unchanged. My reason for presenting this subject is to review the literature and point out that, despite the warnings of Goldthwaite,[1] and Bowman,[2] we are still, I believe, overlooking spondylolisthesis as a cause of backache. Robert W. Johnson, Jr.,[3] writing in Kelly's recent edition of "Gynecology," apropos of this, remarks that "reflex pelvic disorders" and "kidney trouble" are not common causes of backache, as was formerly thought. He says, "the back itself should receive first consideration." The orthopædic surgeon, into whose hands these patients should fall, no doubt is alive to the possibility of this condition, but patients complaining of such symptoms are usually sent for x-ray examination first. Whether the patient goes to the orthopædist first or last, the court of final appeal is the radiologist's opinion on a good lateral plate of the sacro-lumbar region. With our ultra-speed films and modern x-ray equipment the production of such a film is not difficult. A Greek philosopher once said, "One picture is worth ten thousand words." This places a large responsibility squarely on the shoulders of the radiologist.

A review of the literature, which is, comparatively, not extensive, divides the study of spondylolisthesis into two periods. Before 1900, 125 cases were reported, all but six by obstetricians.[4] As a result, the opinion became prevalent that the condition was met with only in females and was preceded by the physiological softening of the pelvic joints incident to pregnancy. The name of Neugebauer is inseparably associated with this period.[5] Between 1900 and 1914 the work of Goldthwaite,[1] Darling,[6] and others established the fact that in America it is more common in males than in females and due, in the majority of cases, to severe injury, such as falling a considerable distance, or to heavy lifting. Goldthwaite thinks that many doubtful cases of backache, including sacro-iliac strains, are in reality cases of spondylolisthesis. Most authorities state that it is a rare condition; Bowman[2] thinks that it is common. There is no doubt, however, that spondylolisthesis occurs often enough to make it of practical importance and that it is frequently overlooked.

The etiology is most logically considered under two headings: (a) predisposing causes and (b) actual. The predisposing causes are congenital defects of the fifth lumbar verteba; its anatomical relation to the sacrum, and, in females, the softening and relaxation of the pelvic joints due to pregnancy. The actual cause is injury. Willis[7] examined 748 spines and found two principal congenital defects in the fifth lumbar vertebra: (1) non-fusion of the spinous process, the commonly seen spina bifida occulta, and (2) complete separation of the lamina on one or both sides. (Fig. 1). Actual separation of the lamina or fibro-cartilaginous union was present in 4.8 per cent of cases. This type of defect would result in a weak or unstable abutment

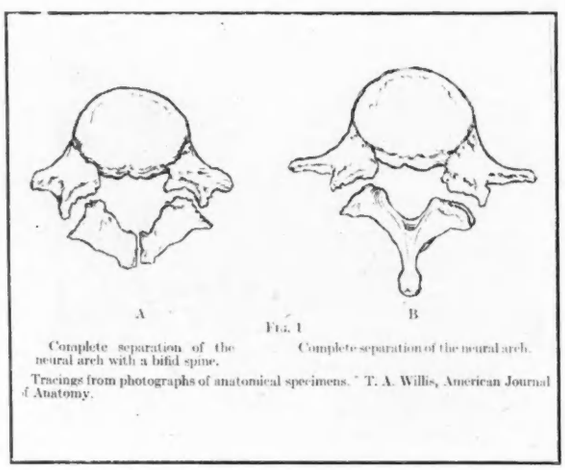

FIG. 1

Complete separation of the neural arch with a bifid spine. Complete separation of the neural arch.

Tracings from photographs of anatomical specimens. T. A. Willis, American Journal of Anatomy.

FIG. 1

* Read before the Radiological Section of the Canadian Medical Association at the sixty-second annual meeting, Vancouver, June, 1931.

for the powerful ligaments required in this location. Add a severe strain, and slipping forward of the fifth lumbar vertebra is the most likely result; add a series of strains and almost any degree of displacement forward and downward may be present, depending on the period in which the patient is examined. George and Leonard[8] report several cases in children in whom the congenital defects above mentioned constituted the only discoverable cause. Another factor predisposing to spondylolisthesis is the downward and forward angle of 30 degrees at which the fifth lumbar vertebra normally articulates with the sacrum.

The physical examination in a well developed case presents the following features: a striking prominence of the sacrum; a shortening of the trunk, as if it were telescoped into the pelvis; lumbar lordosis; wrinkling of the skin and superficial fat across the flanks; and a waddling gait. (Fig. 2). Very suggestive is a history

FIG. 2

of relief from pain after a period of rest and a return of this pain following exertion.

The radiological examination consists of antero-posterior and profile views of the lumbar spine and sacrum. If there is any doubt about the existence of spondylolisthesis repeat the examination, centring over the lumbo-sacral joint. The antero-posterior position frequently reveals three hints, *viz.*, the upward tilting of the spinous processes of the fourth and fifth lumbar vertebræ (Fig. 3), a dense shadow over the first sacral segment resulting from the superimposition of the body of the fifth lumbar, and only four lumbar vertebræ appearing above the pelvic brim. The lateral plate is the one on which the diagnosis is decided. The characteristic downward and forward position of the body of the fifth lumbar vertebra in relation to the sacrum could hardly be mistaken for anything else. (Fig. 4). It should be mentioned

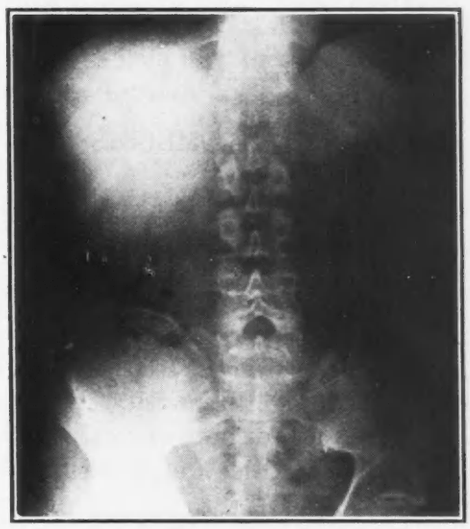

FIG. 3

FIG. 4

that destruction of the intervertebral disc, as a result of tuberculous spondylitis or other rarer lesions in this region, would allow a slipping, but the radiological appearance, history and progress of the patient would indicate the true nature of the disease.

Border-line cases will arise in which, from the x-ray plate alone, there is a question of whether or not a little displacement forward has taken place. The procedure in such instances is exactly the same as with other doubtful medical or surgical problems, *i.e.*, consultation with

the attending physician and the orthopædic surgeon, and a careful consideration of the history, clinical and radiological evidence. The radiologist is a physician, not a fortune teller.

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CORONARY THROMBOSIS: A CLINICAL AND PATHOLOGICAL STUDY*

BY J. C. MEAKINS, M.D. AND W. W. EAKIN, M.D.,

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THE recognition of coronary thrombosis as an anatomical condition has been accepted for many years. It was considered, however, more or less as a pathological curiosity and was not associated with any definite clinical syndrome. It is true that both Osler and Mackenzie recognized the condition as a probable cause of angina pectoris, but they did not attempt to make an ante-mortem diagnosis. It was also considered as being an important cause of rupture of the heart, but this, again, did not enter into ante-mortem diagnosis. Its classification as a clinical entity dates from the past fifteen years and is due to the work of Herrick[1] who, in 1912, demonstrated the possibility of recognizing the condition before death. His further publication in 1918[2] reiterated his former description and added to it. About this time Levine and Tranter[3] also drew attention to its recognition. Since that date many communications have appeared, emphasizing not only the clinical but also the pathological and electrocardiographic aspects of this condition. It is not our present purpose to review this work, but merely to mention how the large number of papers has brought about a condition of mind which has produced the phrase "the coronary problem", leading one to suppose that it is a greater problem to-day than it was a generation ago.

To undertake a comparative study of the incidence of coronary thrombosis as diagnosed ante mortem during the past thirty-five years is impossible, as it is only during the past ten years that this diagnosis has been made with any frequency, and, as is so often the case with newly recognized clinical entities, the diagnosis has become rather popular and is made frequently on insufficient evidence.

The present communication is based upon a clinical and pathological study of 62 cases of coronary thrombosis with occlusion which occurred in the Royal Victoria Hospital during the past thirty-five years. The incidence of its occurrence is to be found in Chart I. Here is depicted the ratio of the number of cases of coronary thrombosis to the number of autopsies during this period, there being 62 cases in 6,548 autopsies—a ratio of 1 to 105.6. Although the incidence has increased some five-fold, the num-

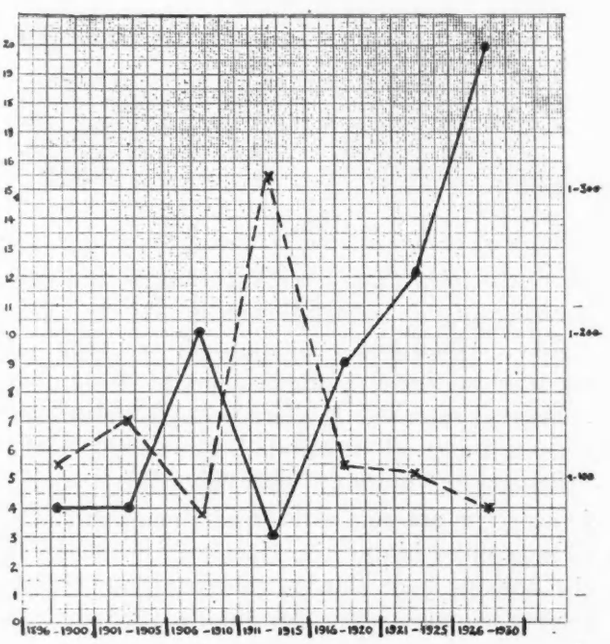

CHART I.—The incidence of coronary thrombosis during thirty-five years. The solid line gives the number of cases found at autopsy in five-year periods; the dotted line denotes the ratio of coronary thrombosis to total autopsies.

* Read before the Montreal Medico-Chirurgical Society, February 23, 1931.

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ber of autopsies has also increased by four times. It will also be noted that the incidence of coronary occlusion in the years 1905-1910 was as 1 to 78.5, there being 10 cases in 785 autopsies; in the years 1925-1930 the ratio was 1 to 79, or an occurrence of 20 cases in 1,585 autopsies. It will be seen by an examination of Chart I and Table I that although there has been from five-year period to five-year period some variation, on the whole the incidence has been fairly regular and there is no evidence to indicate that there has been a pronounced increase in this disease.

TABLE I

INCIDENCE OF CORONARY THROMBOSIS AND RATIO TO AUTOPSIES

Years	*Coronary thrombosis*	*Autopsies*	*Ratio*
1896 to 1900.....	4	439	1:110
1901 to 1905.....	4	559	1:140
1906 to 1910.....	10	785	1:78.5
1911 to 1915.....	3	941	1:314
1916 to 1920.....	9	984	1:109
1921 to 1925.....	12	1255	1:105
1926 to 1930.....	20	1585	1:79
Total.....	62	6548	1:105.6

CLINICAL ANALYSIS

On analyzing the histories of these 62 cases there are a number of points of considerable interest. In the first place they are divisible into two large groups:— first, those with an acute onset, some of which ran a rapid course; and, secondly, those in which the onset is insidious and the course usually more chronic. The first group numbered 34 cases, or 55 per cent. Of these 34 cases 4 died suddenly before any history or physical examination could be made, and may be classified in that group of coronary occlusion which leads to sudden exit. They were 3 males and 1 female and their ages were 65, 69, 70, and 71. The other cases (30) had an acute onset which could be dated from a definite attack of distress. On the contrary, in the 28 cases with insidious onset no definite history of symptoms appearing suddenly could be obtained. In these the cardiac lesion was unexpectedly found in 3, one who died of chronic ulcerative and miliary tuberculosis, one with carcinoma of the prostate, and the third with carcinoma of the rectum and chronic dementia.

Age and sex.—In Table II will be found a comparative analysis of age and sex. It will be seen that out of the 62 cases twelve occurred in females and fifty in males. The average age was 55, and shows that the most prevalent age incidence is between the years of 40 and 59, when 50 per cent of the cases occurred.

TABLE II

AGE AND SEX

Years	*Acute*	*M.*	*F.*	*Insidious*	*M.*	*F.*
10—19	0	0	0	1	1	0
20—29	1	1	0	0	0	0
30—39	4	4	0	1	0	1
40—49	10	8	2	5	4	1
50—59	6	5	1	10	8	2
60—69	5	3	2	9	9	0
70—79	8	5	3	2	2	0
	34	26	8	28	24	4

Onset.—The character of the onset separated the cases into two groups. In the 7 cases, four acute and three insidious, in whom no history was obtainable the details of the onset could not be determined. The remaining cases could be divided into two classes,—those with an acute onset and those with an insidious onset. In the so-called acute variety the onset occurred with explosive suddenness. The important symptoms of onset are set forth in Table III. On analyzing the symptoms in the acute cases dyspnœa was the most frequent. It was of a paroxysmal character, occurring occasionally without pain, but was sufficiently severe to impress itself upon the patient's memory. After the first attack it usually improved, but later occurred on exertion and, as will be seen, the future course was usually progressive. In the cases with a more insidious onset the original attack could not be dated to any particular time, although the indi-

TABLE III

SYMPTOMS OF ONSET

Symptoms	*Sudden*	*Insidious*
Dyspnœa.....	26	20
Pain.....	23	4
Vomiting.....	8	5
Collapse.....	13	0
Unconsciousness.....	3	0

vidual might ascribe the first appearance of dyspnœa to a certain period or month.

Pain, on the other hand, when it occurred, usually appeared with great violence, sometimes localized in the upper abdomen, in other cases in the left præcordium with radiation to the left neck and arm. It was not confined, however, always to these areas, but sometimes extended to the right side of the chest. The violence of the upper abdominal pain was first described by Levine and Tranter[3] who emphasized the possible confusion of coronary thrombosis with acute abdominal lesions. This will be referred to again with regard to the incidence of cholelithiasis. The other symptoms occurred less frequently, although the sensation of syncope, sweating, and pallor have an important corroborative significance in the acute cases.

Physical signs.—The physical signs, in distinction to the symptoms, found in the first few days after the onset, indicative of coronary thrombosis, as described and enlarged upon since the original paper by Herrick, may be taken as follows,— fever, leucocytosis, evidence of a plastic pericarditis, falling blood pressure and electrocardiographic changes. It is quite evident that in such an analysis as we are making only in those cases which were examined within the first fortnight should the presence or absence of the first three signs be taken into account. It is well known that the systemic reaction, as indicated by fever and leucocytosis, is of a temporary nature while the friction rub indicating a plastic pericarditis may be fleeting in its appearance. In the series of cases here analyzed only 20 cases were seen early enough, that is within fourteen days of the onset, to justify the expectation of finding these signs present. The relative frequency is shown in Table IV. In all of the cases the leucocyte count was not recorded; out of 14 there was a leucocytosis in 9 and a normal count in 5. Fever was present in 11 of the 20 cases, while a definite pericarditis was noted in 5. This latter finding was confirmed by post-mortem examination. In the entire series signs of a recent or old pericarditis were found in only 12 cases.

TABLE IV

EARLY PHYSICAL SIGNS IN 20 CASES SEEN WITHIN 14 DAYS OF ONSET

Signs	*Present*	*Absent*
Fever	11	9
Leucocytosis	9	5
Pericarditis	5	15
	High	*Normal*
Blood pressure	2	13

Blood pressure.—The blood pressure in this condition would depend upon the pre-existing state of the circulation. It is significant that with the onset of the coronary occlusion there is a falling blood pressure. This has been noted by many, and is emphasized in these cases by the frequency (13 out of 15) of a normal or low blood pressure shortly after the onset of symptoms. When we come to analyze the blood pressure findings in the whole series we are restricted to the analysis of 40 cases in which definite readings are recorded. It was found to be increased in 13, normal in 18, and sub-normal in 9. This subject will be considered in more detail when the anatomical state of the vascular tree is analyzed.

Electrocardiograms.—It is not our intention to enter into an exhaustive study of the electrocardiographic changes which occur in coronary occlusion. Many articles have been published describing these. The most significant feature is a changing of the Q.R.S. – T deflections from day to day. Pardee, in 1920, first drew attention to a particular change of form which was associated with coronary occlusion. He described the change as appearing a day or two after the obstruction, characterized by a notching of the Q.R.S. complex in the first two leads; the T wave did not start from the zero level of the record in either the first or third lead, and showed an acute deviation without the short iso-electric phase which is present in normal records. The T-wave also became larger than customary, and accordingly showed a somewhat sharper peak, and usually was turned downwards in lead two and in one other lead. It is not to be expected that all these changes are to be found in each record, but enough of them should be present to give a fairly characteristic appearance. There are, however, instances where no alteration can be found. Craib[4] has briefly summarized the reasons for this as follows:

> The alteration in the electrocardiogram that results from local myocardial infarction depends upon the normal contribution of the region in question. Regions of muscle through which the excitation wave travels in

a direction that is perpendicular to the plane of the leads contribute little or nothing to the electrocardiogram, and may be described as "silent areas". When such silent areas are infarcted the electrocardiogram is unaltered, provided the infarction is not accompanied by gross dilatation or conspicuously diminished output per beat.

The size of the heart.—The size of the heart was definitely ascertained in 55 cases before death. Definite enlargement was found in 45 cases and no, or doubtful, enlargement in 10. No examination was recorded of the size of the heart in 4 patients who died before the examination could be made and in the 3 in whom the condition was found as an incidental occurrence. Therefore, for the present analysis, we may say that cardiac enlargement was found in 82 per cent and would be a common and important finding in this condition. In the 10 cases in which the enlargement was doubtful or absent, the onset was acute in 7, and the lesion had only been present for the matter of a few hours or days.

When we consider the possible cause of enlargement in these cases we are faced with three possibilities—a dilatation due to the vascular lesion, a pre-existing hypertension, and a pre-existing valvular lesion. The latter was present in 10 cases, 1 with mitral stenosis, 6 with so-called mitral insufficiency, and 3 with aortic insufficiency. In regard to the cases with mitral insufficiency it was difficult in the antemortem state to be certain whether this was due in each instance to a real productive endocarditis, or whether it was merely a relative insufficiency. Post-mortem examination failed to substantiate the presence of a mitral endocarditis sufficiently pronounced to produce an insufficiency gross enough to account for the cardiac enlargement. It may be stated that, apart from the occasional case of aortic insufficiency, valvular lesions did not play any important rôle in the production of the cardiac enlargement. Therefore, we are dependent upon finding an explanation for the enlargement in a dilatation due to the local vascular lesion or a hypertrophy due to a peripheral vascular disease. Probably both of these possible causes play a variable part in all cases with enlargement.

Arrhythmia.—Cardiac arrhythmias were recorded as follows: extrasystoles in 18 cases; auricular fibrillation in 8; gallop rhythm in 4, and ventricular tachycardia in 1, while in 29 cases the rhythm was recorded as being normal. It is interesting to note that the auricular fibrillation occurred in the more chronic cases, and in every instance both coronaries were the site of extensive sclerosis and multiple scars were found in both ventricles. A detailed autopsy description of the auricles was not recorded, except when there was a mural thrombosis attached to the auricular wall. This occurred in 3 instances in which auricular fibrillation was present. The cases with gallop rhythm were all of the acute variety. Extrasystoles occurred with equal frequency in both those that gave an acute history and in those with the more insidious onset. The single case of ventricular tachycardia recorded was one with thrombosis of the right coronary artery, in which a large mural thrombosis was attached to the right side of the intraventricular septum.

Associated conditions.—The histories gave no evidence of recent infections. In fact, these were conspicuous by their absence. In 26 cases the Wassermann test had been done. It was found positive in 2, or 7.7 per cent. This confirms the repeated observations of others that syphilis plays no part in the production of this type of coronary thrombosis.

Gall stones and diabetes mellitus.—The two most frequent pathological findings outside of the vascular system were the presence of gall stones and diabetes. Gall stones were found in 9 cases, or 15 per cent, while diabetes occurred in 5 cases. In only 1 instance were both conditions present.

General vascular disease.—It has been reported by others that the most outstanding vascular lesion preceding coronary thrombosis is hypertension. Unfortunately, in this series of cases previous estimations of the intravascular pressure were obtainable in comparatively few. We therefore take as our criterion anatomical findings at post-mortem that might lead one to form an opinion as to whether or not preceding hypertension had been present. That arteriosclerosis *per se* does not produce hypertension is now fairly well accepted. The contrary, however, is not the case, and it is now being recognized that probably the most productive cause of arteriosclerosis is hypertension, leading as it does to a general hypertrophy, not only of the heart but of the intimal and muscular coats

of the arterio-vascular system. Furthermore, it is now recognized that this hypertrophy, with narrowing of the vascular lumen, leads not only to local degeneration through curtailment of the blood supply but is also fruitful in leading to local obliteration with or without thrombosis of the more minute vascular architecture. We have taken as our criteria of long-standing vascular disease probably produced by hypertension the following points:— (1) thickening of the radial artery; (2) sclerosis of the retinal vessels, as found during life; (3) the presence of renal sclerosis; and (4) general arterial atheroma. It may be felt that this is rather an arbitrary basis but we have adopted it for want of more conclusive evidence.

The character of the radial arteries was recorded in 50 cases. They were reported as being thickened in 24, while in 26 they were normal. It is of interest to note that the insidious or more chronic cases of coronary occlusion showed a greater percentage of sclerosis than did the more acute ones, as 60 to 35 per cent.

Examinations of the fundus oculi were recorded in 15 cases, and arteriosclerotic changes were found in 6. This small number of observations does not warrant any conclusions being drawn.

In the 62 autopsies renal fibrosis was recorded as present in 38 cases and absent in 20. In 4 cases the autopsy description was not sufficiently specific to indicate the exact condition of these organs. However, it may be concluded that in those cases where the exact condition of the kidneys was known renal sclerosis was present in 65 per cent.

A pronounced degree of general arteriosclerosis was reported in 21 cases, while such a sweeping description could not be given in the rest. When we come to examine for the presence of atheroma in the coronary arteries themselves, we find it present in both the right and the left coronary in 50 cases, present in the left coronary alone in 6, and in no case was it present in the right coronary and not in the left, while in 6 cases no evidence of coronary atheroma was reported. These 6 cases were in comparatively young persons, the ages being 15, 28, 32, 34, 35, and 48, with an average age of 32. In none of these 6 was there any evidence of general atheroma, nor was there any evidence of renal sclerosis. In 3 of them we find blood pressure records as follows: a patient aged 32, blood pressure 160/90; one, aged 34, 140/110, and one, aged 35, 126/90. It must be borne in mind, however, that these records were obtained shortly after the coronary accident had occurred.

Localization.—The localization of the thrombosis in the coronary arteries reveals its occurrence in the right coronary in 6 instances, in the right and left in 11, and in the right, left and circumflex coronary arteries in 1. This last was in a case of dementia in which the lesion was unexpectedly found at post-mortem. In 44 the thrombosis was confined to the left coronary, the most frequent branch being the left descending. This is in agreement with the findings of others. It is interesting to speculate as to why the left coronary is so frequently involved in this thrombotic process. It is true that it is more frequently and extensively the site of atheroma than is the right, and therefore one tends to the supposition that it is on account of the increased work which the left side of the heart has to do; but this does not altogether explain the interesting subject of what has been called the "provincial distribution of atheroma."

We think it may be taken from these findings that atheroma of the coronary arteries, whether or not the result of hypertension, is a most important contributing cause to the development of gross coronary occlusion. Therefore, anything that contributes to the production of arterial atheroma, such as diabetes or hypertension, will naturally appear frequently as a predisposing factor. This, however, does not seem to be the whole story, or else coronary thrombosis would be much more frequent than it is, because death from hypertension and the anatomical changes which follow upon it are seen frequently in post-mortem examinations. In the past five years 50 cases of essential hypertension came to autopsy in the Royal Victoria Hospital, or one in every 30 autopsies, while generalized arterial atheroma was an anatomical diagnosis in 173 autopsies during the same period. Furthermore, if it were solely due to local atheroma one would have expected a much higher incidence of luetic infections. We know in a general way that luetic vascular disease has greatly declined in the past thirty-five years. For the twenty years up to 1915 the number of aneurysms admitted to this hospital was 122 in 22,000-odd admissions, or a ratio of

TABLE V

A TABULATION OF THE DISTRIBUTION OF CORONARY, MURAL, ARTERIAL, AND VENOUS THROMBOSIS IN THE SIXTY-TWO CASES

No.	CORONARY			MURAL THROMBI				ARTERIES													VEINS									
	L.	R.	C.	L.V.	R.V.	L.A.	R.A.	R. Pul.	L. Pul.	Splen.	Cereb.	Renal	Popl.	Fem.	Carot.	Aorta	Mesen.	Innom.	Iliac.	Rad.	Iliac.	Fem.	Pul.	Jug.	Pelvic	Saph.	Bron.	Popl.	Prost.	Ovar.	Inf. V.C.
1	1											1																		
2	1			1							1																			
3	1	1		1	1			1	1			1						1						1						
4		1			1							1																		
5	1			1				1	1																					
6	1			1				1																						
7	1			1	1			1	1				1	1								1								
8	1	1		1	1			1	1																					
9	1	1										2		2					1											
10		1																												
11	1																													
12	1			1																										
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59	1							1	1	1																				
60	1			1	1		1	1	1			1						1				1								
61	1																													
62	1							1	1																					

about 5 per 1,000, while in the last fifteen years there have been 63 in 35,000 admissions, or a ratio of 1.8 per 1,000.

In seeking for other causative factors in the production of coronary thrombosis one naturally turns to the question as to whether or not these cases give any indication of intravascular clotting elsewhere. When we examine into this question we cannot fail to be impressed with the great frequency of thrombosis elsewhere in the body, (see Table V). In the first instance, the great frequency of mural thrombi developing from the infarcted area is most impressive. In our series mural thrombi occurred in 29 cases, or close to 50 per cent. If this had only occurred over the infarcted portion of the myocardium a ready explanation would be forthcoming, but in 8 of these cases mural thrombi were found in chambers of the heart not supplied by the thrombosed vessel, nor was there any evidence of infarction that could account for their occurrence. Thrombosis in arteries distant from the heart might be accounted for by emboli when mural thrombi were present in the left ventricle or left auricle, but 15 cases did not reveal this association, arterial thrombosis occurring without any evidence of mural thrombi in either the left auricle or ventricle.

Similarly when we come to the veins, we find that in 11 cases definite venous thrombosis was recorded. These thromboses were found from time to time in the iliac, femoral, jugular, pelvic, saphenous, prostatic, ovarian veins, and the superior vena cava. A striking location for intravascular thrombosis was found in the pulmonary arteries. This, of course, might also be explained by emboli when mural thrombi were present in either the right auricle or ventricle, but in 26 cases in which there was pulmonary artery thrombosis 19 revealed no right-sided mural thrombi.

These results would seem to indicate that there is another factor present in this disease, namely, a predisposition to intravascular clotting. Individual cases also point strongly in this direction. Case 31 was a boy, aged 15, who five months before had had typhoid fever. During his convalescence he had progressive dyspnœa and as the weeks passed he developed progressive congestive circulatory failure. At autopsy there was a thrombosis of the descending branch of the left coronary with a mural thrombosis in the left ventricle and extensive and multiple thromboses in both pulmonary arteries. There was no evidence of coronary atheroma. Another patient (Case 7) was admitted to the hospital with thrombosis of the left femoral artery. This was followed by a sudden thrombosis of the opposite artery, which eventually extended into the right iliac artery. Some weeks later he died suddenly of an acute thrombosis of the descending branch of the left coronary artery. There was found at autopsy, in addition to the thrombosis of the arteries of the legs, extensive thrombosis of the branches of both renal arteries which apparently long ante-dated his coronary accident. General arteriosclerosis was also found, recognized before death by the thickening of the radials and the sclerotic processes in the fundi.

The association of symptoms of coronary disease with thrombo-angeitis obliterans of the extremities has been noted by Allen and Willius,[5] who report 7 cases of angina pectoris with this arterial lesion. There was sudden death in one case. Unfortunately an autopsy was not permitted. They draw attention to a case reported by Perla[6] in which there was thrombo-angeitis obliterans and occlusion of the left coronary, also a similar case reported by Lemann,[7] in which there was complete occlusion of the branches of the right coronary, and 2 cases reported by Buerger.[8] The cases reported by Buerger and Lemann were apparently associated with an arteriosclerosis, while in that described by Perla it would appear that the coronary arteries were involved by a process similar to that found in thrombo-angeitis obliterans. Lemann's case was in an elderly man, but the two cases reported by Buerger were in young people, aged 21 and 24. Case 7, reported above, might have been considered an acute thrombo-angeitis obliterans, but the autopsy did not confirm this supposition.

On reviewing the published autopsy protocols of other writers dealing with coronary thrombosis, frequent thrombosis of other vessels is found recorded. Unfortunately, many of the autopsy records are given in an abbreviated form and deal chiefly with the description of the heart. It is quite possible that in certain

instances fuller details would have been more illuminating on this aspect of the question. In 152 collected autopsies (not including those reported in the present communication) multiple coronary thrombosis was found in 22 (14.5 per cent); mural thrombi in 48 (31. 5 per cent), in 6 of whom a mural thrombus was found in a chamber not affected by the occluded vessels. Thrombi were reported in other vessels in 24 (15.7 per cent) and in 12 of these they occurred in an artery or vein where there was no suggestion that they could have been due to emboli from a mural thrombus.

The frequency of mural thrombi in this condition is out of all proportion to its occurrence in other endocardial lesions, whether sclerotic, luetic, or rheumatic. It would seem, therefore, as if a more thorough examination of the blood particularly in regard to its clotting properties would be indicated.

PROGNOSIS

The conception that coronary occlusion always gives rise to explosively acute symptoms is not warranted by this series of cases. Attention has been drawn to the large number of cases (50 per cent) in whom the onset was insidious. Furthermore, the conception that exit is acute is not borne out by our findings. It would be expected that the more acute the onset, the more likely to be sudden death. This is quite true. Of the 34 cases with an acute onset, 4 died, as already mentioned, before an examination could be made; 2 others died within a few hours of onset; 4 within the first week; 3 in the second week; and 1 in the fourth week after onset; while 20 lived for more than a month and died of progressive circulatory failure,—2 in the second month, 5 in the third month, 5 in the fourth month, and 1 each in the sixth, seventh, eighth, and tenth months, while 1 lived for two years and 3 for more than two years. In the cases with the insidious onset the patients all lived longer than two months and died of a gradual circulatory failure, except one (Case 15 mentioned above), in whom final exit was sudden and unexpected, although symptoms of circulatory failure had progressively developed. In the other 24 the exit was gradual, 7 dying within the first year, 2 in the second year, 2 in the third year, and 12 lived for more than five years after the onset of symptoms. In addition to these there were the 3 already mentioned in whom the coronary occlusion was an unexpected post-mortem finding. Rupture of the heart occurred in 3 cases. In 2 there was a rupture of the left ventricle leading to a hæmopericardium, and in 1 a rupture of the intraventricular septum.

It may be held that many cases of coronary occlusion die before they are seen by the physicians, and therefore do not die in hospital. This may be so, although it is a difficult point to prove, and this frequency can only be determined by a careful scrutiny and analysis of the cause of death revealed by the coroner's records. On the other hand, it may be taken that many cases do not die immediately, and therefore a certain number would probably be admitted to hospital. This holds as true in this condition as in any other grave illness. It may be stated from our findings that approximately 50 per cent of those with an acute onset died within three months. On the other hand no patients with an insidious onset of their symptoms died before the third month and 50 per cent of them lived for more than five years.

If this be the case one naturally asks oneself how an individual with an extensive coronary thrombosis may continue to live a more or less useful life. It is true that his usefulness progressively declines, but on the other hand this is true in all cardiovascular diseases. There is evidence, however, to indicate that extensive anastomosis of the coronary circulation occurs. This was noted in a number of our cases, but mention of it was only made when it was grossly apparent, and one would expect that if more carefully sought for it would be found more frequently. Wern has drawn attention to the possibility of the myocardium being supplied through the Thebesian vessels. It is an interesting point to note that in the 6 cases where the right coronary artery was involved, exit was sudden in 4, while in the other 2 it was gradual, but there was definite evidence of extensive anastomosis. Twelve cases had thrombosis of branches of both the right and left coronary. In all of these there was a history of a prolonged circulatory decline and in only one was the exit sudden. In this case, No. 17, there was a recent infarct of the descending branch of the left coronary, with old thrombosis of the right

coronary and rupture of the intraventricular septum. If this latter accident had not happened it is intriguing to speculate as to how long this person might have lived in spite of the extensive coronary occlusion.

TREATMENT

The treatment of coronary thrombosis is the same as that of thrombosis elsewhere. As the affection cannot be completely cured it must be endured, and an essential feature is the allowance of time in order that not only adaptation to the injury may be acquired but also that anastomosis may take place. Therefore, rest is of the greatest importance. This is rather difficult at times to insist upon, as the acute symptoms of coronary occlusion comparatively rapidly disappear, and the patient cannot understand why a prolonged period of absolute bed-rest is insisted upon. A firm attitude and judicious instillation of fear is therefore strongly indicated. The use of digitalis is, I believe, at first to be recommended but seldom. As time passes and symptoms of circulatory failure develop it is then indicated. In the rare case of ventricular tachycardia quinidine would be indicated; otherwise medication, apart from the use of morphia during the acute attack, would logically have but little value. The most difficult period of the treatment comes when the patient is allowed more liberty and activity. It is impossible to lay down hard and fast rules governing this. It is a question of individual cautious trial and experiment. The easy production of dyspnœa and fatigue are contraindications for liberty. If the patient be intelligent much can be done with his cooperation. When signs of congestive circulatory failure develop the cases must be handled in exactly the same manner as when they are due to other causes. The occurrence of repeated thrombosis must always be borne in mind and must govern us not only in our prognosis but also in the treatment.

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ON THE ANGINA PECTORIS OCCURRING IN THE COURSE OF CERTAIN ANÆMIAS*

BY NORMAN B. GWYN,

Toronto

TEMPTING as it might be to say that angina pectoris may be caused by a severe anæmia, it is difficult to prove the statement. Associated disease of the coronary arteries is the probable explanation of most of these anginas, even when they are met with in cases of extreme blood loss or blood deficiency. Alterations in the tissues of the aortic arch, of a nature likely to give rise to anginal symptoms, are not an essential part of the pathology of anæmias, and while, admittedly, the influence of toxæmia as a cause of the breast pang will always be difficult to evaluate,[1] yet the majority of the cardiologists remind us that in the consideration of those cases of severe anæmia and toxæmia which may exhibit the syndrome of angina there must always be raised the question as to the state of the coronary arteries.

The subject is one of extreme interest because, as we know to-day, the general opinion as regards angina is that it is a disease caused by a local ischæmia or anoxæmia of the heart muscle,[2] a localized ischæmia, as a rule, which interferes with the muscle-function in one or other ventricle. A very distinct difference in ventricular activities may be assumed to result. What the immediate process may be which causes pain to be registered when a coronary artery refuses the blood supply necessary to increased ventricular contraction is difficult to demonstrate; from the physical standpoint however, we may imagine that an increasing heart action finds that an impaired coronary circulation is unable to keep pace with exorbitant demands,—increased oxygen requirement during

* Presented at the Section of Medicine, Academy of Medicine, Toronto. From the Medical Clinic, Christie Street Hospital, December, 1930.

muscle activity is not met with increased oxygen supply.*

An explanation of this sort does away with the assumption that the coronaries go into active spasmodic contraction, and that they are something more than passive agents in the production of an anginal attack. One feels, however, that those of the older clinicians who studied the manifestations of Raynaud's disease as seen in the retinal arteries must of necessity have seen in the closing and opening of the arteries of the eye-grounds an analogy with what they thought existed in the heart muscle during an anginal attack, and the century old theory of Allan Burns,[3] that angina resulted from a condition of intense spasm of the coronaries, acquired a firm hold upon our imaginations and has retained it for many years.

Due consideration must be given to other theories as to the nature of angina, particularly when considering those cases of the disease which have been met with in the course of severe anæmias or toxæmias. A poisoned heart muscle, to follow Mackenzie's reasoning, would seem at first sight to explain the angina occurring in a patient with a severe anæmia. In some few instances we are led to the support of this view by the fact that in some of these "anæmic anginas" the coronaries have been found smooth and elastic, and, again, in some others, by the demonstration of the fact that the cure of the anæmia has been followed by the disappearance of the angina.[4] It is less easy to fit Allbutt's theory of the aortic origin of anginas into the state of affairs that has been demonstrated from time to time in fatal cases of anæmia with angina.† Enlargement of the heart and degeneration of the whole bulk of the heart muscle is the most evident finding in such cases and one can hardly assume that aortic stress in connection with some slight fatty degeneration of the aortic intima has been sufficient to call forth anginal pain. The majority of observers seem to feel that though this degeneration of the heart muscle found so often in these severe anæmias is an essential part of anoxæmia and toxæmia it is not apt by itself to cause the heart pain. Keefer and Resnick, however, refer to "anæmic anginas" as happenings which tend to support the theory of the anoxæmic origin of the disease.*

Reverting to my title I am sure I voice the sentiments of many observers when I say that we have all wondered why angina has not been met with more frequently in the course of severe anæmias. One has only to go over his cases of blood loss and blood destruction and visualize the appearance of the heart muscle, to ask himself why the conditions present in a muscle so degenerated do not give rise to pain on the slightest exertion, if the theory is correct that anoxæmia or ischæmia is the underlying cause of the classical picture of angina. It is a question by no means easy to answer, though it has been pointed out that the heart of a severe anæmia differs from the heart of an angina, in that the whole heart body has degenerated in the one (hence no upsetting of ventricular balance), while in the other there would only be a small part of the muscle affected. Another very distinct point of difference will be that the heart of a man who is suffering from angina is by no means a heart which has reached the limit of its reserve, or one which has become degenerated in all its structure. Victims of angina are not as a rule dyspnœic or œdematous subjects.

My interest in the association of angina with anæmia was excited by the appearance in the clinic of the case here to be described.

CASE REPORT

R., aged 50 years, came complaining of severe pain behind the sternum, which would assail him on any undue exertion or on exposing himself to the cold of the morning air. This pain was very severe, would originate in the middle of the sternum, pass to the left and down the inside of the arm. It would last for three to five minutes and would compel him to stop whatever he might be doing, whether it were light work or his

* The experiments of J. A. MacWilliams are usually quoted in this connection. After cutting off the blood supply to the arm he demonstrated that as long as the member is kept at rest, no pain develops. It is the continuation of muscle effort in the face of an obstructed circulation which produces pain in these experiments. He elaborates the experiments detailed by Allan Burns. (MacWilliams, J. A., and Webster, W. J., *Brit. M. J.*, 1923, **1**: 51.)

† Sir Clifford Allbutt in his discussion as to the cause of angina follows Parry in assuming that sudden stresses in the aorta start the chain of events which lead to the production of heart pain. Allbutt assumes that there will be found regularly disease in the coats of the aorta and that the stretching of the already impaired tissue stimulates the interlacing nerve plexuses.

* A personal communication from S. C. Keefer says that in a group of his cases the angina disappeared when the blood returned to normal. Keefer feels that angina may occur in anæmia with or without coronary disease, but is probably more common in patients who have both the anæmia and coronary disease than in patients who have anæmia alone.

favourite exercise of walking. With a few minutes of rest he would acquire relief, *but this rest was always necessary in order to let him carry on.* There was no remarkable amount of dyspnœa, no cough, and he could give us no information as to what he looked like during these attacks; he was not aware himself of any particular change in the rate of his heart beat. Angor animi was not a feature.

The examination of the patient showed that he had a mouthful of badly infected teeth and that he had quite severe bleeding hæmorrhoids, with some ulceration just inside the rectum. He had a severe anæmia—the hæmoglobin down below 40 per cent; the red cells 3,500,000. The blood picture did not suggest in any way Addisonian anæmia, but resembled more that produced by steady loss of blood or infection. It was considered that the teeth and hæmorrhoids both played an active part in the production of the anæmia, and arrangements were made for the removal of the teeth and the tidying up of the rectal condition.

Under observation for some weeks it was noted that nitroglycerine quickly controlled the attacks of heart pain, though there was no distinct increase in the blood pressure. The electrocardiographic reports given by the late Dr. L. M. Murray some weeks previously had read as follows: P wave normal, T_1 and T_2 high. No ventricular preponderance. Doctor Murray had further noted that there was some increase in the size of the heart, and that at the apex the first sound was divided and followed by a faint systolic murmur. The Wassermann test was negative. It was considered that the man suffered from a certain degree of myocardial weakness, due primarily to his anæmia, and evidenced by a mild degree of dyspnœa. The angina was a symptom of more or less recent development.

After removal of the teeth and operation on his rectum the patient steadily improved while he was taking iron and copper. His blood picture improved: hæmoglobin 47 per cent; red cells 3,800,000, and he went out looking and feeling distinctly better. He was able moreover to take considerable exercise without producing attacks of cardiac pain.

It would seem from the history and progress of this case not only that the patient has been suffering from an angina of quite severe grade but also that treatment directed to the bettering of his blood condition has been followed by a considerable degree of success in preventing the attacks of heart pain. One recognizes that symptoms and physical findings suggest a certain degree of generalized heart muscle weakness, as would be usual in an anæmia, though one is familiar with the fact that many of the hearts which may register an angina in response to certain demands may show surprisingly little in any form of examination.

The question of greatest interest, of course, is the relationship of the angina to the existing anæmia—whether merely incidental or whether intimately associated. It would seem reasonable, in view of the patient's improvement subsequent to his treatment, to link up the attacks of heart pain with the poor condition of the blood, yet we must realize that in this patient we are quite ignorant of the state of the coronary arteries, nor do we know what may have taken place in the way of opening up of new channels of collateral circulation.

This relationship of angina with anæmia is well discussed by Keefer and Resnick[2] in their classical paper on angina, a paper which has had much to do with the spreading of the view that angina results from anoxæmia or ischæmia of the heart muscle. One gets the impression from their discussion that the angina which occurs in the course of anæmias is an anoxæmic symptom. These authors do not seem unwilling to look upon these "anæmic anginas" as conditions of distinct interest and as happenings which help one to accept the idea of an angina being a response to anoxæmic and ischæmic alterations in the heart muscle. According to their view, anoxæmia and ischæmia result from certain definite conditions which impair the circulation in the heart muscle. These conditions are: arteriosclerotic narrowing of the coronaries; disease of the aortic arch which has affected the mouth of the coronaries; syphilitic disease of the aortic arch, with aortic regurgitation; and, finally, those diseases of the blood which by under-nourishment of the heart muscle contribute to its degeneration. They point out that rheumatic aortic disease, being usually associated with stenosis, would less likely be associated with lowered diastolic pressure than would syphilitic aortic disease, and they also remind us that rheumatic disease of the aortic valve does not tend to spread out to the mouths of the coronaries.

Commenting on the rarity of the occurrence of anginas in the course of anæmias, J. B. Herrick makes the statement that he was one of the first to note this association. In a paper written in 1918, he says, "We have been interested in four patients with high grade anæmia who describe perfectly typical anginal attacks on walking", and he surmises that blood of poor quality going through somewhat narrowed coronaries might favour the development, on slight provocation, of an anginal spell.[5]

In a second communication, Herrick remarks that he has seen three other similar cases.[6] There seems no doubt from his description that these patients suffered from a severe type of angina. In one, the history and findings were more suggestive of pernicious anæmia; in two, the anæmia was more evidently secondary to

other conditions. The autopsy performed in one of these two latter cases showed that the left coronary artery was sclerosed and solid in most of its extent. The muscle of the heart showed fatty infiltration with areas of fibrosis. A few findings of this sort would incline one to believe that disease of the coronaries rather than poor blood and poor heart muscle was at the bottom of the angina, and, in the absence of autopsies in these cases of "anæmic anginas", it would be difficult to say with any degree of assurance that the anoxæmia occurring as part of the severe anæmia was sufficient to give rise to the anginal syndrome.*

The results of treatment in cases of "anæmic angina," if one may presume to use such a term, would seem to indicate, however, that the anæmia plays at least an important part in the production of the cardiac symptoms. Transfusion has apparently cured several cases almost at once, and from the reports to hand from several observers it would seem that by the building up of the blood condition a severe angina may disappear.[7] Whether one should conclude from this that we can close our eyes to the possibility of coexisting coronary disease is of course another question. By relieving the anæmia we have, of course, lessened considerably the degree of anoxæmia, and if the anæmia has been permanently done away with, a heart might well carry on even with partially obstructed coronaries. Any aid which might be expected from the development of a collateral circulation has probably been discounted by the time the patient appears before us.*

As concerns the case which I have reported I might say, in conclusion, that it would seem that he has suffered from angina which has developed in the course of blood loss and toxæmia. As a result of treatment he is better of his anæmia and practically cured of his angina. This may mean that anæmia and toxæmia by themselves have caused the angina, but I would still prefer to say, however, that I have some doubts as to the actual state of his coronary arteries.

* Carey, *Arch. Int. Med.*, 1931, **47:** 899. (A fatal case of pernicious anæmia which had had the history of attacks of precordial pain. The author in his comments says, "Coronary sclerosis undoubtedly had something to do with the sudden death of this patient." A complete autopsy report is given.)

* In the recent publication of Sir Thomas Lewis,[8] one notes that he does not accept unreservedly the idea that anoxæmia causes heart pain. He suggests as a result of his experiments that changes of a physico-chemical nature in the tissue spaces between the muscle fibrils so stimulate the nerve endings as to give rise to the symptom of pain. The failure of the circulation to remove the waste products is however back of this tissue change. Ischæmia, (a result of obstruction of the blood flow) is of course, the picture he is describing.

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HUMAN SIDE OF THE HOSPITAL.—Joseph Brennemann states that after an extended experience with a dozen widely differing hospitals, as interne, attending physician, visitor and patient, his attitude toward a given hospital centres in the emotions, in the heart, rather than in the mind, and he believes that reaction is freely shared by others. It is not the idealness of equipment and of organization but the subtler spirit of enthusiastic and self-effacing cooperation, of steadfast, sympathetic loyalty and devotion to a common cause that is bigger than any individual, that makes hospitals. It is the atmosphere, the morale of a hospital, that makes or wrecks its reputation and its usefulness. The children may be well cared for; the medical staff may be made up of able clinicians and investigators; the superintendent may be as wise as Solomon and as "just" as Aristides, and may see that the whole machinery of administration is well oiled and the physical equipment faultless; the board of trustees and the women's board may be actively interested and may do all that could be desired in other ways; the nurses may be intelligent, faithful and well trained; the internes and residents may be well schooled and prepared for their duties, may, indeed, get up at seven and be at breakfast on time; and yet the vital spark will be lacking if there is not back of it all an all-prevading spirit of cooperation and of kindliness or, as Emerson has so beautifully expressed it, "an element of love that permeates it like a fine ether."—*J. Am. M. Ass.*, 1931, **97.**

DERMATITIS FROM SWEAT BANDS OF HATS.—D. I. Macht records the case of a physician who in two successive years developed severe dermatitis of the forehead with formation of pustules, following the use, on the first occasion, of a Panama hat, and on the second of a Leghorn hat. Extraction of the sweat bands with alcohol and ether led Macht to the conclusion that the bands were finished with a nitrocellular lacquer containing some irritating pigments.—*Urol. & Cut. Rev.*, June, 1931, p. 445.

STUDIES IN CHOLESTEROL METABOLISM*

1. PHYSIOLOGICAL VARIATIONS IN BLOOD CHOLESTEROL

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SINCE the momentous discovery of cholesterol in gall stones by Conradi (1775) the subject of cholesterol metabolism has produced much controversy and argument. It was not until Windaus (1909) developed an accurate method of estimation in the blood that some clarity of thought was achieved. Much of the work on this subject before 1909 has been vitiated, much since that time is not analyzable, on account of variations in methods, time of estimations and the physiological state of the patient. It has even been suggested that the season of the year affects the level of the blood cholesterol. The chaotic state of the literature on this subject and the wide normal limits of variation in blood or plasma cholesterol have rendered it difficult to summarize accurately our physiological knowledge.

PHYSIOLOGICAL VARIATIONS

It has been known since 1911 that the level of the blood cholesterol is raised from the third month of pregnancy.[1] The maximum level is reached in the last months, followed by a return to normal shortly after confinement.[2] A quoted reference to a premenstrual rise in blood cholesterol has not, to my mind, been confirmed by other observers.[3] Currie,[4] using an uncommon method for cholesterol estimation, has noticed a seasonal variation in the blood, the average figures given being considerably higher in the summer than in the winter. This observation has not been confirmed by others, and as will be shown in a later paper such variations do not occur.

It has been shown that in prolonged starvation cholesterol is increased in the liver and blood.[6] By far the most interesting physiological problem is the relation of the blood cholesterol level to the ingestion of food. That cholesterol in the blood is maintained at a constant level is a well known fact. A very low blood cholesterol is incompatible with life. It follows that the factors responsible for the maintenance of this level may be either exogenous or endogenous. Cholesterol must be either synthesized in the body or the absorption of fat or cholesterol in food from the gastrointestinal tract will maintain its level in the blood.

The problem is difficult to solve. Animal experiment helps us but little, since many animals do not synthesize cholesterol and are not accustomed to this substance in their food. One method of attempting to prove the endogenous nature of cholesterol synthesis is by means of balance experiments. Naturally, if a person excretes more cholesterol than that contained in the food it is reasonable to suppose that it is being manufactured in the body. Cholesterol is excreted almost entirely in the bile in carnivorous animals,[5] and this is converted by bacterial action to coprasterol. This conversion to coprasterol also occurs in man, making balance experiments exceedingly difficult. Fortunately, in infants no such change takes place and an excess of output over intake from one to four times has been found. This work by Gamble and Blackfan[7] has been confirmed by Beumer.[8]

In adults, even allowing for technical difficulties, an excess of output over intake of cholesterol has been found.[9] It would seem from these experiments that cholesterol is actively synthesized in the body. Muller[10] adds that should the exogenous supply be deficient the endogenous sources will maintain the level of the blood. This is well seen in starvation.[6]

If the source of cholesterol is largely within the organism the effect of cholesterol feeding is of the greatest interest. It is of even greater interest in the study of the diseases in which an increase of cholesterol in the blood and tissues is so striking. Many observers[11 to 16] have found what they believe to be significant rises in

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blood cholesterol following heavy meals and after feeding fat or cholesterol. Upon analysis, however, some of the methods used are found to be obsolete, and, with our present knowledge of the normal limits of variation, some of the increases would seem to be insignificant. On the other hand, many outstanding workers in this field have found no appreciable increase of cholesterol in feeding experiments.[17 to 21] Gardner and Gainsborough[22] conclude that normal persons differ widely in the cholesterol content of the blood and that these variations can not be due to absorption. A meal with a cholesterol content of 0.15 g., if totally absorbed, would only increase the blood by 0.00025 per cent.

It is our opinion that many of the conflicting results of cholesterol feeding in man are due to the wide hourly fluctuations which occur in normal people as shown in the present paper. It must be emphasized however, that large amounts of fat or cholesterol given for some time *will* and *do* produce a sustained hypercholesterolæmia.[22]

Pathological Variations in Blood Cholesterol

Normally cholesterol has been found chiefly in the adrenals, which have been suggested as the place of origin of this substance in the body. Deposits have been found in numerous pathological states. As esters, they are found in the arteries in arteriosclerosis, in malignant tumours, in xanthomatosis of the skin, in the retinal spots of diabetes and in gall stones. These doubly refracting lipoids are very striking in the tubules in nephrosis, and the nephrotic stage of glomerulonephritis. They are also present in cholesterolosis of the gall bladder. Increase of cholesterol in the blood has been noted in arteriosclerosis, diabetes, nephritis and nephrosis, amyloid disease, and in the presence of gall stones. Low values have been found in persons dying of infection, in Addison's disease, in pneumonia, and in various anæmic states. These pathological variations will be dealt with in subsequent papers.

Normal Variations in the Blood Cholesterol

The method of estimation used in this study was that of Bloor, Pelkan and Allen.[23] This method, though not so accurate as the digitonin method, is the only one possible when a considerable number of blood analyses are being made in one day by one technician.

Blood cholesterol estimations were made in 28 normal fasting individuals. Each of these persons was given a special fat-free, low-protein supper at 5 p.m., and reported for the test at 8 o'clock the following morning. Blood was taken at 8 a.m., 10 a.m., 11 a.m., 12 noon and 1 p.m., in every case. In eight additional cases blood was taken at half-hourly intervals under the same conditions. In a further twelve cases pure cholesterol was given immediately after the 8 a.m. specimen of blood had been withdrawn and the resulting curves obtained. A check by another laboratory was made on several occasions, with satisfactory agreement in the figures.

Summary of Results in Twenty-eight Normal Cases

The results are graphically shown in Tables I, II, III and Chart 1. The highest figure obtained at any time was 218 mg. per 100 c.c. of blood, the lowest 127 mg. Only 5 of the 140 estimations showed a value above 200 mg. per 100 c.c. The mean value of all estimations was 161 mg. From these results, normal values, by the method used, are taken to be between 130 and 200 mg., which is in general agreement with most modern observers. Certain striking facts are to be observed in Tables II and III. The maximum of all variations for each hour average 207, the minimum 131. These indicate the very

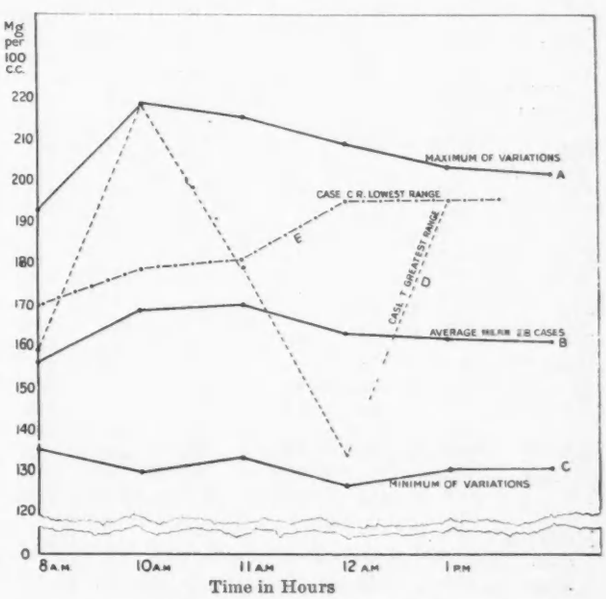

Chart I.—Showing the variations in fasting blood cholesterol over a period of five hours.

wide normal limits in the fasting state. The mean value for all cases was 156, 169, 170, 163, 162 mg. per 100 c.c. for each hour.

The average range from high to low during the five hours was 40 mg., a figure well above the probable error expected. The highest total variation during the five hours was 195 mg. (See Chart 1). The lowest total variation was 25 mg. and the average 84 mg. Such figures and a study of the individual curves shown in Table II, show a striking fluctuation from hour to hour in the blood cholesterol. Such fluctuations, when corroborated by other observers, will constitute a strong argument in favour of the synthesis of cholesterol in the body. They also prove the fallacy of studying the blood cholesterol except under the most rigidly controlled conditions. Consecutive daily cholesterol estimations on a given patient will give widely varying results and lead to misinterpretation.

Further study of the figures given will show that within the limits of normal variation some curves may be low and somewhat fixed or the level may be high and fixed. These facts simply show the difficulty of plotting a standard normal blood cholesterol curve. It is perhaps true that since marked fluctuations are the rule,

TABLE I

SHOWING THE AVERAGE CHOLESTEROL CONTENT OF THE BLOOD IN 28 NORMAL INDIVIDUALS, WITH THE LIMITS OF VARIATION

		Total cholesterol	*Grams per 100 grams*
		Average	*Limits of variation*
Gardner and Gainsborough	Male	0.170	0.11—0.22
	Female	0.153	0.08—0.23
Present Study—28 Cases			*Mg. per 100 c.c.*
	Fasting 1st Specimen	0.156	0.135—0.193
	2 hours	0.169	0.130—0.218
	3 hours	0.170	0.133—0.215
	4 hours	0.163	0.127—0.209
	5 hours	0.162	0.130—0.203
	Average of means—0.161		

TABLE II

SHOWING THE RESULTS OF THE FIVE-HOUR BLOOD CHOLESTEROL CURVE IN 28 NORMAL FASTING INDIVIDUALS

	8 a.m.	*10 a.m.*	*11 a.m.*	*12 a.m.*	*1 p m.*	*Mean*
JA.....	165	195	199	137	150	169
BI.....	151	180	164	180	150	165
BIL....	142	168	142	179	135	153
DE.....	193	166	208	181	155	180
DY.....	146	175	181	144	...	161
HI.....	141	175	143	152	178	149
HO.....	161	164	196	160	169	168
HOOK..	151	135	152	130	164	146
JU.....	185	159	158	150	164	163
KI.....	186	163	133	127	130	146
LA.....	169	180	181	191	203	169
MA.....	138	139	180	133	185	154
MAR...	177	145	151	153	165	158
CR.....	170	178	181	195	195	183
RO.....	166	213	170	205	164	183
PA.....	154	187	215	209	185	190
PAI....	160	172	196	196	173	179
KU.....	177	177	162	205	170	178
ST.....	139	163	157	163	195	163
WE.....	135	130	143	151	163	144
WI.....	168	180	167	163	167	169
HA.....	163	171	133	166	153	157
ZY.....	149	174	174	161	141	159
YA.....	156	164	173	135	151	155
SP.....	149	171	153	177	157	161
BA.....	149	150	185	156	155	159
SI.....	145	151	181	134	136	147
TO.....	158	218	179	134	195	176
Mean for each hour	156	169	170	163	162	

Average of means..... 161

TABLE III

SHOWING THE STRIKING HOURLY VARIATIONS IN BLOOD CHOLESTEROL IN NORMAL PEOPLE IN FASTING STATE. (28 CASES)

	Time in Hours					
	8	*10*	*11*	*12*	*1*	
	Mg.	Mg.	Mg.	Mg.	Mg.	Maximum mean
Maximum figures for each hour.....	193	218	215	209	203	207
Miminum figures for each hour.....	135	130	133	127	130	Minimum mean 131
Case with.... greatest variation in 5 hrs.	158	218	179	134	195	
Case with least variation in 5 hours.....	170	178	181	195	195	

Average range, high to low (28 cases)—40 Mg.
Average total variation in 5 hours (28 cases)—84 Mg.
Highest total variation—195 Mg.
Lowest total variation—25 Mg.

TABLE IV

HALF HOURLY VARIATIONS IN BLOOD CHOLESTEROL OF NORMAL FASTING INDIVIDUALS

	8 a.m.	*8.30 a.m.*	*9 a.m.*	*9.30 a.m.*	*10 a.m.*
AR.....	156	162	184		
BA.....	152	192	146	164	152
KI.....	133	128	156	158	146
HA.....	158	174	161	165	152
TH.....	163	151	162	192	148
TO.....	163	177	168	170	193
HI.....	162	157	146	169	188
RU.....	152	185	151	176	142

TABLE V

SHOWING EFFECT OF CHOLESTEROL FEEDING IN NORMAL ADULTS ON THE BLOOD CHOLESTEROL

Hour / *Name*	*8*	*10*	*11*	*12*	*1*	*Mean of 5 specimens*	*Mean after cholesterol*
EL.....	193	189	133	172	164	170	164
KE.....	173	173	141	177	141	161	157
PE.....	157	183	225	166	170	179	186
BL.....	191	171	168	192	215	187	186
MA.....	229	213	192	192	221	209	204
MO.....	194	176	159	158	147	157	160
EX.....	186	201	204	227	204	204	209
EN.....	212	223	220	228	206	219	219
FR.....	145	147	154	151	143	148	148
ME.....	169	171	168	165	174	167	167
OP.....	166	162	170	166	170	168	168
MC.....	162	158	163	157	160	160	161
					Average mean.....	177	177

they, and not the fixed curves, constitute the true normal. Half hourly estimations reveal smaller but similar variations (Table IV).

THE EFFECT OF CHOLESTEROL FEEDING

Twelve normal cases (Table V) were given cholesterol immediately after the 8 a.m. specimen had been withdrawn. Doses varying from two to ten grams were fed in a mixture of 40 c.c. 98 per cent alcohol and skimmed milk. No significant evidence of cholesterol absorption was obtained except in cases P. E. and E. N., where suggestive curves were obtained. These two cases received only 2 grams of cholesterol. Others receiving 10 grams showed no striking increase. While large single doses of cholesterol are apparently not absorbed to an appreciable extent in normal cases, this does not hold true in abnormal states such as arteriosclerosis and nephritis, as will be shown in a subsequent paper.

CONCLUSIONS

1. Wide variations were found in the five-hour blood cholesterol curve in 28 normal fasting persons. Such variations render single or haphazard studies of blood cholesterol of doubtful value.

2. There was no evidence of cholesterol absorption or effect upon the blood level in 12 normal cases given large doses of this substance.

3. Normal fasting variations, curves and means for the Bloor method are established.

4. The physiology of cholesterol absorption, synthesis, and metabolism has been discussed.

For assistance received during preparation of this and succeeding papers, we wish to thank Miss Phyllis Bennest for able technical skill; Prof. A. T. Cameron for helpful criticism and advice; and Prof. C. R. Gilmour for permission to utilize clinical material in the wards of the Winnipeg General Hospital.

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IDENTIFICATION OF NEWBORN INFANTS.—A method of "branding" infants in an unmistakable fashion has been instituted in the Shore Road Hospital in New York City. The scheme was first suggested by Dr. Herman Goodman in 1928. This so-called ultra-violet ray method will now be adopted as routine in this institution, according to its superintendent, Mr. Charles Greenfield. The mother's arm and the infant's thigh are "branded" with initials and numerals made by ultra-violet rays and stencils. The captions become visible within five hours and may last as long as nine months. This method is claimed to be superior and more fool-proof than any previously used or popular method. Surely any method of preventing such controversy as blazed the pages of this nation's publications a number of months ago should be generally encouraged.—*The Diplomate.*

SMALLPOX IN THE WORLD.—Reports from the League of Nations show that India alone recorded more cases of smallpox during the first half of 1931 than did the United States. From India 63,376 cases were reported against 22,184 from the United States. England and Wales stood third on the list with 4,412 reported cases. No cases were reported from Scotland, Germany, Italy, Netherlands, Switzerland, Philippine Islands, and Lithuania.

WHAT IS NEW IN TUBERCULOSIS?

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Ninette

WHEN Oberon, the king of the fairies, wished to send a message, his faithful Puck replied, "I'll put a girdle around about the earth in forty minutes". When the king of all Canadian doctors set me certain duties for this day I tried to go Puck one better, and said "I'll put a girdle round about the subject of tuberculosis in twenty minutes". But the more I think of my own temerity the more I realize that any such girdle must be done in telegraphic dots and dashes, and not in a continuous line.

In the first place what is new *in the strategy of our campaign against tuberculosis?*. Have we won our old objectives, and what are our new objectives? Our chief old objective was to heal the sick man who knew he was sick and came of his own accord to see his doctor about it. He seldom came early, because early tuberculosis has few symptoms, often none. But, late or early, many have been healed, and at the same time made safe to others by healing or teaching or supervision. Our new objective is to find the men, the women, and especially the children who have been in contact with the sick man, and who are not yet sick, though perhaps on the way. From the very beginning of our healing arts the sick man and his care have been on the conscience of the physician. Now we should ask not only, "what does this man suffer, and what can we do for him?", but also "who have been *seeded* by this man's infections, and what can we do for *them*?". We need not only a sense of bodily foci of disease but also socio-medical senses of family and community foci of disease. Our old studies were diagnosis, management of the case, and prognosis. To these we must add epidemiology.

What is new in diagnosis? The newest thing in diagnosis is the new kinds of people we have to diagnose. When the sick man brings himself to the doctor the whole street can sometimes make the diagnosis as he passes. But when the doctor crosses the Rubicon and goes scouting among contacts, especially children, he finds that all his decisions—decisions diagnostic, differential, prognostic, and decisions about what Sir Thomas Browne calls "managery", are all much more difficult.

In tuberculosis the history is always important, and the fountain pen mightier than the stethoscope. All that makes for wear and tear makes for tuberculosis. Even our professional grandfathers, who believed, as we do not, in the hereditary transmission of this disease, did not base more upon family history than we do. It is of course not sharing the same family tree that counts, but sharing the same house, the same bed, or board, or environment; it is not closeness of consanguinity but of contact. Never accept without question any general statement about there being no tuberculosis in the family. Go into details yourself, and still be doubtful until you have all the family chest portraits, especially of parents and grandparents, safely in your x-ray album. Where new tuberculosis is found there can be found traces of previous old tuberculosis seven times out of ten. Grandmother's "stomach cough", when the x-ray has passed upon it, may explain the indefinite illnesses of half a dozen grandchildren. A grandmother making a visitation westward tuberculized two little families almost before the parents' eyes. Little Susan's far advanced tuberculosis had its source revealed when the "hired girl" who slept with her had x-ray plates showing extensive disease. A girl of 26 with advanced disease had no idea where it came from until we examined her aunt, who was off work 16 years ago on account of poor health and had made a visitation at this girl's home and slept with her. The source of disease in a boy of 16 could not be determined until it was remembered that his uncle died of tuberculosis in the

* Read at the annual meeting of the Canadian Medical Association, Vancouver, on June 24, 1931.

same house when this boy was an infant. Such histories are not only interesting epidemiological studies; they are very practical elements in present diagnosis.

Perhaps the biggest of the gradual but revolutionary changes in the diagnosis of pulmonary tuberculosis is the comparative eclipse of the stethoscope by the x-ray plate. We have passed from the age of Laennec to the age of Roentgen. It is not twenty years since a paper on diagnosis concerned itself chiefly with refinements and over-refinements in the classification of râles. The stethoscope is still a very useful instrument, but limited in its application and not an instrument of precision. Auscultation bears about the same humble relation to x-ray vision to-day as percussion did to auscultation twenty years ago. In the lesser measure we see through a glass darkly; in the better, something like face to face. The stethoscope leaves half of our chest problems untouched, and only half settles the other half. It can find tuberculosis, but it cannot, except rarely, find early tuberculosis, and cannot find earliest tuberculosis. It can find tuberculosis but cannot rule out tuberculosis either early or late. It cannot demonstrate pathological changes, and cannot follow at all accurately the progress of disease or of healing. All the questions we need to ask about the lesion, extent, stage, type, cavitation, fibrosis, involvement of pleuræ or diaphragm, are answered much more clearly by the x-ray plate. Indeed they are scarcely answered at all without it. So much has the eye displaced the ear that a deaf man can be a skilful chest diagnostician. Of course x-ray plates must be well made and well read or they are but blind leaders of the blind, and deep are the diagnostic ditches many have been tumbled into by them.

But, you say, since the humble stethoscope, and not the x-ray plate, must be the *vade mecum* of most practitioners, why extol the impossible? There are several reasons. Where plates are already available they can be used more. Where they are not now available they can usually be made available. And whether they are available or not we should know and face the plain facts that without a good x-ray plate suspected tuberculosis should never be ruled out, *can* never be ruled out. Without a good x-ray plate, well interpreted, tuberculosis in children should never be ruled out, *can* never be ruled out. Without an x-ray plate old, lifelong, advanced, and very extensive bilateral pulmonary tuberculosis will often be missed. At any rate put small faith in physical signs, and still less in their absence.

Opaque oil, such as lipiodol, is a wonderful help, especially in differentiating from tuberculosis a condition considered rare, but really common, and responsible in its various stages for most of the bad coughs in the community —bronchiectasis. Like most new measures opaque oil has had its full share of misuse and misinterpretation.

The bronchoscope, which is a chest instrument and not a throat instrument, should be available in every considerable medical centre, and in the hands of a man experienced and interested in the problems of chest disease. A man experienced in throat work only may know little and care less about what the bronchoscope has to show of chest disease. A bronchoscopist's view about chest disease has a broad field that can be cultivated more usefully.

Examination of the sputum was never more important than now, for with all our facilities there are still differential diagnoses in which the finding of bacilli must be the final word. And do remember that one examination of sputum, or a dozen, and nothing found, settles nothing. When we could not find bacilli in an ordinary smear we used to concentrate; then we made use of guinea pigs. Now we incubate and grow the germs on potato medium. Bacilli are thus found in one-third of the sputa negative to the ordinary smear method, even with the best stains. The culture method is 2,000 times as sensitive as the smear method, and 250 times as sensitive as the guinea pig method.

If I were to mention tuberculin in diagnosis you would say it is not new, and I would say it is not diagnostic. Tuberculin is perennially new, and it is more prognostic than diagnostic. The healthy adult will give the best reaction, the well-doing tuberculous person will react, but the tuberculous person losing ground likely will not. A tuberculin reaction in an adult is something like a vaccination scar, a partial insurance against sudden infection and acute disease. The adult who should worry is the one who does not react. In children, especially little children, the interpretation of

the tuberculin test is quite different. When a little child reacts to tuberculin he should be thoroughly examined and closely watched, and his whole household examined also.

The five diagnostic criteria of the Saranac School, hæmoptysis of a drachm or more; a history of pleurisy with effusion; persistent crepitations in a lung apex; characteristic x-ray shadows in lung fields, and tubercle bacilli in the sputum, are still good reliable standards and standbys, though we must explore the mediastinal area as well as the lung fields, and diagnosis in children has its own laws, which are different from the laws in adults.

If we are to make early diagnosis we must, as Morlock teaches, suspect every acute febrile illness, even without physical signs, in a young adult, except, perhaps, during an influenza epidemic. And a diagnosis of influenza outside of a time of epidemic is usually wrong. We must very strongly suspect recent contact with an open case, and keep in mind the primary stage as well as the later stages of disease. Never wait for constitutional symptoms to appear; appeal early and always to the x-ray, and pay no attention to negative physical findings. Tuberculosis is insidious in onset, but not slow. It lies latent for a long time, but may come like a bolt from the blue. Even a few days will sometimes show marked changes.

There are two extreme schools of practitioners that keep sanatorium men awake at nights—those who diagnose tuberculosis on mere imagination, and those who wait until signs and symptoms alike cry out for judgment, until the golden time for treatment has passed and any possibility of good prognosis gone glimmering. Somewhere between this Scylla and this Charybdis lies the safe channel. We have not yet found a royal road to the diagnosis of tuberculosis. The processes are even more complex than they were, but much more accurate and fruitful. The steps in a diagnosis, like the steps in a court case, are the gathering up evidence from all possible sources, careful consideration of the facts thus gathered, and finally judgment based on them.

What is new in the treatment of tuberculosis? What about the outdoorness, the fresh air and sunshine of "taking the cure"? We are as strong for these natural advantages as ever, but they are not specifics for tuberculosis. They are natural advantages which all living people should have, especially the sick, and most of all, the chronically sick. I never enter ordinary hospital wards with their indoor air and uniform temperature without wishing I could open them all out upon breezy sun-lit balconies. Constant day and night indoorness that is debilitating for the well can scarcely be good for the ill. Night sweats used to be put down as characteristic of advanced tuberculosis but they practically disappeared when the balcony came, with air changes at least one hundred times as frequent as in the best ventilated rooms.

Sunlight, as we all know, is more now than the genial brightness of life: it has become a special treatment. It is still more or less empirical, but is useful as a general tonic. It can be an actual poison also, and harm or even kill as well as heal. He who would use it safely must know its indications and contra-indications, its therapeutics, dosage and toxology, as he would know strychnine and arsenic before attempting to use them. Like all new or new-old procedures, light has been over-praised, over-used, and generally abused. It should be applied in measured doses, in well selected cases and always watchfully.

This use of optimum natural conditions is a sort of internal secretion the sanatoria have elaborated, which they would like to throw into the general circulation of medical science for the benefit of all sick people.

Mother Nature's prime secret and favourite prescription for almost all the physical and mental ills of her erring children still is *rest.* It "knits up the ravell'd sleave of care", is "balm of hurt minds, great Nature's second course, chief nourisher at Life's feast." No wonder that it is the great basis of all treatment of tuberculosis. Fatigue makes ill, and rest makes well. He who knows when and how the sick should rest, and when and how they should be active, knows much of the treatment of tuberculosis, and of many ills besides. We believe in more rest, more thorough-going rest, more kinds of rest, and longer rest than we did twenty years ago. No credit will be gained from assuring tuberculous people that a few months will bring perfect health. Landis says a year is the minimum, even for early

non-toxic cases. Tuberculosis can be cured, but the prices to pay are time and patience, and the foundation is rest.

But at last pulmonary tuberculosis has found a specific. Comparatively passive ways of treatment are supplemented by more active ways. The new specific is the treatment by collapse or compression of the diseased lung or lungs, and after all this is simply a local application of rest. The surgeon has invaded what twenty years ago, or even ten, seemed still a safe preserve for the physician. The first great advance after Hippocrates, that made the modern treatment of tuberculosis, was the sanatorium method; the second is the surgical collapse of lungs. We are discussing what is new in tuberculosis. Artificial pneumothorax is not just new, but the widening of its scope is new every new day. The wholly surgical measures, phrenic paralysis to quiet lung movements, raise the diaphragm and so decrease lung volume, and thoracoplasty, the cutting of ribs to collapse the chest wall upon the lung—these are new and their scope also widens daily.

It is not beyond the truth to describe this new principle of rest through semi-surgical or surgical collapse as a specific treatment at last for tuberculosis. No tuberculous patient is having justice without a full consideration from time to time of what these measures can accomplish. To overlook these in pulmonary tuberculosis or miss the time in which they are possible is on a par with overlooking surgery in cancer or missing the time when it is possible. The range is constantly widening; we are applying artificial pneumothorax at earlier and earlier stages, and also at later and later stages. Using it in early stages is not using a sledge hammer to drive a tack, because pneumothorax is not a sledge hammer, and any focus of tuberculosis that is definite is not a tack. It has no features that can be called bad, except the formation of fluid in some cases. There is no reason why it should not be used in earlier disease and every reason why it should. The best indication is the lack of contra-indications and there are no special contra-indications. Hæmorrhages or expectoration with bacilli or beginning cavitation—even a small single cavity—urge pneumothorax. In late, neglected, or advancing disease the prognosis goes up many points when collapse is found to be possible for the worse lung, and is improved even more proportionately when both of two bad lungs can be collapsed. It seemed to us in the earlier days that one lung must be fairly good if the other was to be collapsed, but now we freely apply some collapse to both and even put men with double collapse to work.

In the Manitoba Sanatorium half our patients have pneumothorax and in most who have missed it the reason is adhesions. When we began to use pneumothorax we thought of it last; now we think of it first. Pneumothorax should always be at least considered at the time of the very first examination. We can scarcely recall a regret for having made use of it, but many regrets for not having used it. The summer season in which it is possible may come to a sudden end at any time with the frosts of pleurisy and consequent adhesions. The purely surgical measures of phrenic avulsion and thoracoplasty have their special indications, but, roughly, they are second and third choices after pneumothorax is ruled out. Here also we are finding indications earlier and earlier, with better and better results.

Tuberculosis is spoken of as a chronic disease. Sometimes it is, but it can be a very active disease also. We can never depend on its chronicity. It can turn a sharp corner while our backs are turned. The more passive measures that are called *taking the cure* must be supplemented by the more active measures of *giving the cure*. Eternal vigilance is as necessary as in most other diseases. Tuberculosis cannot be put on a balcony shelf and looked at once in six months or so. "Milk, eggs, and the back verandah" never was a reasonable formula, and now is hopelessly obsolete. Home treatment cannot compare with treatment where all the facilities are at hand. Pulmonary tuberculosis needs close, careful watching, experience, judicious choice of routine, and adaptation of special measures. The best barometer to show storms coming or going is the x-ray plate.

What is there new to say about complications? The earlier and the fuller the diagnosis of the main disease has been, and the more suitable and thorough-going is the treatment of the main disease, the less trouble will complications give. I have already said that even in ad-

vanced disease night sweats practically disappeared with open air treatment.

We can all recall the horrors of tuberculous enteritis, with cramps, diarrhœa, rapid decline and hopelessness generally. We believe now that tuberculosis in the intestine is almost as treatable and curable as tuberculosis in the lung—if we just make the diagnosis and apply the treatment soon enough. The horrible symptoms we have described are the symptoms of late intestinal involvement, as the hectic cheek and cavernous cough are the symptoms of late hopeless consumption. Diagnosis must be made two long stages earlier than that. The late symptoms are complained about; the early symptoms are not complained about, but can be elicited by asking. They are usually slight nervousness or irritability, slight constipation, slight discomfort, slight impairment of appetite. But even at the stage when symptoms are barely recognizable great damage has been already done. The really early diagnosis of tuberculous enteritis, like the early diagnosis of the pulmonary disease, can be made by the x-ray plate, and by that only. For twelve years we have given barium meals as a routine in all cases of pulmonary tuberculosis. Now enteritis does not take us by surprise. Treatment is begun early, and the old picture is seldom seen except in a patient neglected to sheer hopelessness before treatment is begun. Treatment includes a smooth diet, light therapy, and all general measures made more intensive. The barium meal has to be observed at quite different hours from the usual to get the fullest information.

A tuberculous larynx used to be considered a second worst complication, and would yet if definite findings in cords were waited for to make the diagnosis. The look from below upwards is really much more valuable than the look from above downwards. That is, a bad lung is the biggest element in diagnosis of a diseased larynx. The larynx is the doorstep of the lung. Good treatment for the lung is the best element in treatment of the larynx. The collapse treatment of lungs has done much to reduce tuberculosis in the larynx from a major complication almost to a minor one. As to the diseased larynx itself, the great standby is still rest, that is silence, and sun applied directly to the larynx helps, but has to be used very carefully.

Even the red terror of pulmonary hæmorrhage is tamed. We have a specific. What drug is it? It is no drug at all. Half the pharmacopœa has been tried and has failed, or worse than failed — done harm. The worst modern mistreatment of hæmoptysis is the giving of morphine. This drug should be given almost never, though a little heroin, a very little, mark you, for the purpose of modifying cough but *not stopping it*, is a standby. Ice bags on the chest are of the devil. What else could they be, when the real danger of hæmorrhage is the setting up of pneumonia? Hæmorrhages are treated by rest, reassurance, a little heroin as mentioned above, mild laxatives as needed, bland foods, somewhat restricted fluids—and the *specific*. For the reassurance to be of any use the doctor must believe in it himself. The trouble is that doctors and nurses who have seen little hæmorrhage are usually farther up in the air than the sufferer himself. And what is the specific that has been hinted at? It is artificial collapse of the lung, preferably by pneumothorax. Unfortunately, it is not always applicable.

Pleurisy is so often tuberculous that, with effusion, we may almost disregard the exceptions and apply the therapeutic principles of tuberculosis. Treat it intensively by real rest, and for a good long time, letting the x-ray plate tell when to stop. The sedimentation reading is menacing until the shadow has been absorbed. Pleurisy casts a long shadow of lowered resistance. Except for diagnosis don't trouble fluid until it troubles you. In diagnosis call pleurisy tuberculosis; in treatment allow for it as tuberculosis; and in prognosis remember that it is tuberculosis.

About pregnancy views are clearer. For a woman with active or extensive tuberculosis pregnancy is suicidal and should be avoided at all costs. When such a woman becomes pregnant the uterus should be emptied sometimes, but seldom. In more than twenty years of treating tuberculous women I am sure I have not asked for the emptying of the uterus ten times. A man of equal experience recently told me he had not recommended it once in ten years. The dictum that no tuberculous woman should marry or bear a child is wrong. A

woman with moderate tuberculosis, well healed, and a few years behind her, who is careful, well counselled, under good conditions, and well provided for, should not be denied the adventure of motherhood, and under the conditions outlined quite likely both mother and child will do better than the average. After delivery in such a case the binder should be brought up to give some support to the chest as well as the abdomen.

I have already said that in the past few years the treatment of pulmonary tuberculosis, which was almost purely medical, has become partly surgical. To balance up, the treatment of what used to be called surgical tuberculosis has become much less surgical than it was, at least less operative. Rest, time, and the advantages of light, air, etc., are the essential curative agencies, and operation often actually calls for explanation. In children especially, and in gland, bone and joint disease, and in testes, operation is often a confession of failure—perhaps unavoidable failure, but still failure. Yet it does sometimes hasten cure. In all such cases, and even in kidney tuberculosis where operation is more likely to be necessary, the policy of helping Nature to effect the cure bulks large. Operation at its biggest is just an incident, however spectacular and important, in a long course of non-operative treatment. The art of cure is long but the time of operation fleeting.

What is new in prognosis?. Have we any better inkling than we had of what is going to happen, any truer glimpses of the end from the beginning? The x-ray is shed equally on diagnosis and prognosis. It shows us the strength of the enemy, the extent of lesions, complications, the pathological picture. But to have prognosis, that is foreknowledge, we must know not only the strength of the enemy but also the power of the individual to resist. Besides the old means—bacilli, pulse, temperature, sex, race, temperament, family history, courage and all the rest—we have a new laboratory aid to prognosis in the sedimentation index, as old as John Hunter, but new again in our day.

The actual results of treatment are better than they were. With the new armamentarium in diagnosis and treatment more people are getting better, cures are more complete and permanent, and failures are fewer. Prognosis is becoming both easier to make, and also more favourable.

The last new thing in the realm of tuberculosis I will mention, and most important of all is—*children.* The charm of children is their "surprisingness." In the past few years there is a new light on tuberculosis in children, thanks to such men as McPhedran. We have long been hunting and hunting among adults for the early lesions and early stages of tuberculosis and have notoriously failed to find them. It is strange we have been so slow to see that some at any rate of the early lesions in an infected household would be most likely to be among the children, whose contacts are the closest contacts, and whose soil is virgin soil. Our ideas about children lagged a generation behind our knowledge about adults, chiefly because we had a single standard for measuring alike disease in the adult and the child. But the two types are almost two diseases, so different that they have little more than the causal organism in common. To use the terminology of syphilis, the *primary lesions* of tuberculosis are usually found in children, the secondary and tertiary usually in adults. The very beginnings of tuberculosis are found commonly in children and more seldom in adults, and the more advanced stages are found commonly in adults and seldom in children. Diagnosis, treatment and prognosis all differ as between the young and the older. In the adult there are usually symptoms; in the child usually none, or slight, late and difficult to estimate. No single symptom is pathognomonic. Cough is as often absent as present. A plump appearance does not rule out disease, nor does emaciation prove it. The stethoscope has little value. "By physical examination alone the most skilful examiner *cannot make a positive diagnosis* of tuberculosis in children; neither can he exclude it as a possibility—no matter what the appearance of the child." (Chadwick).

The great *new light* on childhood tuberculosis is shed by the x-ray. Skilfully made films, carefully and thoughtfully interpreted, help more than all other means together to an understanding of the diagnosis, the course and the prognosis of the childhood phase. Plates in two planes are often needed, postero-anterior and oblique. Now that we know better what the tuberculosis of childhood is our ideas of prognosis have changed. It is

true that the adult type of tuberculosis in a child has a very bad outlook, but *childhood tuberculosis* in a child may have a very good outlook.

The discovery of the child in tuberculosis opens up a great new continent for exploration. It is in this new continent of childhood that the most fruitful explorations of the anti-tuberculosis forces will be made during the next generation. These sunrise people of a new day are always new, always fresh, always invite our quests, always more than repay what we can do for them. What we wish to do for the race must be done for the child. On their behalf we must even learn a good part of our tuberculosis all over again.

SCOLIOPATHEXIS*

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MY subject is "Scoliopathexis," a term not found in any of the text-books or dictionaries, medical or general, yet one that will be exploited in this text for better or for worse and I crave your patient indulgence of my temerity. I must here acknowledge the kind offices of a Toronto graduate, Dr. W. H. Alexander, Professor of Classics in the University of Alberta, for his assistance in securing a more or less euphemistic, if somewhat disconcerting, title for my paper.

Our country, keeping in tune with other parts of the world, has for several years been inured to the prevailing obsessions of big business, mass production, prosperity, success, and many other shibboleths of highly positive phases of national development. As a consequence there has been a growing demand among the various classes of people who earn their living by physical or mental toil for an elevation of the standards of living, with a diminution of the strain incidental to the fundamental requirements of self-preservation. It would almost appear that the ultimate objective is one of maximum comfort with minimum effort. Primarily, such an objective may be one of commendable altruism, but unfortunately in the process of its evolution there have crept into our activities many adverse and costly influences which threaten our peace of mind and which undoubtedly require some careful re-adjustment.

The financial fabric has latterly been torn violently asunder. In comparison with the recent cataclysm, the South Sea Bubble may well be regarded as a flash in the pan. Now the resulting problem of economists and sociologists is to find ways and means for a return to normalcy, the fundamental basis of which must in all probability be a readjustment in the relative values of goods and service. It may be that we have not yet fully sensed the moral of the Great War and that unless and until we do so we shall find ourselves impinging upon another maelstrom of strife and stress infinitely more convincing than the last. With these facts staring us in the face, perhaps we shall not be presumptuous as a profession if we realize that our obligations to society are on the increase and that these obligations are of paramount sociological importance. Politics and political power have been gradually forced into an almost overwhelming degree of paternalism, perhaps more pronouncedly in our mother land than elsewhere. With immigration the influence has spread westward. In consequence, the old aphorism, "Root hog or die," which was the guiding principle of our ancestors, — rugged ancestors,—is likely to be relegated to the social junk-heap and in its place a new spirit, savouring strongly of sham and intrigue, may take root and throttle the mechanism of our industrial development.

An eminent British jurist defined a malingerer as one who is not ill and pretends that he is. An equally eminent British neurologist has

* Read before the Academy of Medicine, Toronto, March 3, 1931.

defined a malingerer as one who feigns illness or who deliberately, wilfully, and knowingly induces or protracts an illness with the object of avoiding duty, claiming money compensation, exciting sympathy, or for any other reason. This neurologist indicates also the need of distinguishing between malingering and valetudinarianism. He states that the former is a term used to denote the sense of conscious and deliberate simulation or exaggeration, the latter term comprehending the unconscious or subconscious simulation or exaggeration of disease or its symptoms.

With such definitions it must be quite apparent that no malingerer and no valetudinarian is likely to accept with equanimity such a label. Either will resent the stigma implied, and in consequence of the resentment will endeavour to rationalize his actions. The net result is a deeper implantation of the perverse attitude of mind and a greater task in uprooting it. At this point in the argument it is well for us to recognize the solemn fact that malingerers and valetudinarians are not so easily recognized as these definitions might lead us to believe. The two terms, therefore, being at once ill-defined and more or less calculated to induce resentment, are quite out of place in our professional armamentarium. Nor is the more technical term "neurotic" much better adapted to the purpose of a conscientious physician. It too has a stigma and stinks in the nostrils of the laity. It too excites animus in one thus labelled. So well known are these facts that the prudent physician labels such patients or pseudo-patients as cases of "nerves", by which act he unwittingly sows the seed of a more profound disability than the one that may already exist. In other words our nomenclature in these respects is not only faulty but dangerous. It defeats its own object, the desired object of preventing a perverse mental attitude in relation to disease.

Undoubtedly there are many instances where Greek labels have a profound value in the treatment of certain human disorders, chiefly because they are ill understood by the untrained lay mind. To tell a man that he is a malingerer or valetudinarian or neurotic is only to court disaster in future professional relationships. So the introduction of a newly coined Greek term may avert such an impasse. "Scoliopathexis",* while not entirely euphemistic, is at least polite. Moreover, it is respectful and believably devoid of stigma. It courts respect because it contains nothing to signify a sinister or unworthy motive. With such a label the physician is in a better position to offer a good prognosis, and he is in a much better position strategically to effect a cure in an amicable manner. Let us then be truly grateful to the classics if we have found another means of preserving an *entente cordiale*. There is indeed a sense of humour involved, which enhances the cordiality, and which is so much more advantageous than that brow-beating attitude of mind that is so likely to assert itself in one who has discovered or thinks he has discovered an attempt, conscious, subconscious, or unconscious, to misrepresent something to him. The term bridges over the chasm between the conscious on one side and the subconscious or unconscious on the other. It helps to effect a friendly compromise. A provocative impasse is less likely to occur. There can be no question that in the relationship of the professional man and his client any statement by the former implying sinister motives in the latter may be likened in action to the repulsion of two positive poles. Furthermore, we must recognize incidentally that there may be conditions which in the broader sense justify malingering. We may be bound to admit that malingering, or wilful and conscious simulation of disease, may be born of noble, if not technically legal, motives. A modern Hamlet may appear in the offing at any moment.

So much for this apologia which must necessarily accompany and rationalize the hurling of a new generic term into the nomenclature of medicine. Let us boldly enlarge upon the idea. The term "scoliopathexis" is offered as a generic term to signify a perverted, twisted, or even crooked state of mind in relation to disease, and it must be almost self-evident that there are at least three varieties, three fundamental clinical types, so to speak, of the disorder. First, there is the imitation or simulation

**Scoliopathexis:*

Derivation: σχολιός, crooked, twisted, perverted.
Πάθος, disease.
ἕξις, a state of mind.

Literal meaning: a twisted or perverted state of mind in relation to disease.

of disease by a healthy person. We mean by this a physically healthy person. It is under this heading that we recognize that clinical entity of ill repute, "malingering". For this let us adopt the more humane term "pathomimesis",* and thereby clothe a wolf in the vestments of a sheep. Secondly, the exaggeration or magnification of an existing diseased state. Under this clinical type we recognize valetudinarians, neurotics, lead-swingers, and cases of "nerves." For this group, and with due deference, another new term is promulgated, "pathopleiosis."†

Thirdly, the minimization of an existing diseased state even unto the point of total repudiation. Under this heading we recognize a group of persons who, having a major or minor disorder, physical or psychic, take the attitude of belittling it or entirely dissimulating it for an ulterior purpose, good or bad. The term "pathomeiosis" is respectfully submitted to cover this entity.‡

Summing them up, it will be noted that the four terms thus promulgated are free from any implication of motives, and may therefore be used advisedly in verbal or documentary statements without casting reflections. They simply signify unemotional cold facts and for practical purposes they are sufficient. Nevertheless, while our terms are devoid of the imputation of motives, we must not lose sight of the fact that motivity is the prime essential of their production as entities. Etiologically speaking, there is a *motif*, whether it be conscious, subconscious or unconscious, or whether it be frank or cryptic. The physician must have his own mental reservations in the assessment of motives, and these reservations may be used or expressed or repressed according to the indications interpreted by his best judgment. A diagnosis having been made, the physician's duty is usually clear and that duty may be executed without flinching. Therefore, in elaborating the scheme it is desirable that an attempt should be made to marshal the outstanding human motives that induce scoliopathexis and apply them, however imperfectly, to the three different clinical types.

Let us first enumerate the more important of the great, dynamic human motives as follows:— the acquisition of money and property; the preservation of health; the pursuit of love and passion; the preservation of youth and the rejuvenation of age; the perpetuation of the family name and tradition; the promulgation of social, economic and political theories in peace and war; the acquisition of fame; the desire for justice; the accomplishment of revenge; the craving for sympathy; the dissemination of religion.

Secondly, let us specify the more emotional elements of human experience that so frequently result in an overwhelming urge to escape from a disagreeable or intolerable situation:— financial strain and business worries; legal entanglements; fear of dependency and insecurity; fear of disease, physical and mental; fear of death; incompatibility of social, domestic, sexual and occupational relationships; grief, jealousy, disappointment and disillusionment; disturbing memories of harrowing experiences; revelation of secret vices, ailments and entanglements.

It is only necessary to glance at this formidable, and still incomplete, list of human complexities in order to appreciate the maxim of Rousseau, that man is born free yet is everywhere in chains. Is it any wonder that the fundamental ego should give expression to paradoxical outbursts in those relationships with which the physician by virtue of his profession is brought in contact? Is it not true that all of these motives are intimately bound up with the general concept of scoliopathexis? Most of them may be associated with pathomimesis, many of them are associated with pathopleiosis, several of them are associated with pathomeiosis. In pathomimesis the outstanding motives are the acquisition of money, escape from legal entanglements, escape from circumstances involving danger to life or health

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Pathomimesis:
Derivation: Πάθος, disease; μιμέομαι, to imitate; ησις, suffix denoting a state or condition.
Literal meaning: a state of imitating disease.

†*Pathopleiosis:*
Derivation: Πάθος, disease; πλεῖον, greater, larger; ωσις, suffix denoting a state or condition.
Literal meaning: a state of making disease greater or larger.

‡*Pathomeiosis:*
Derivation: Πάθος, disease; μεῖον, less, too small; ωσις, a state or condition.
Literal meaning: a state of making disease less or too small.

such as stress of campaign in time of war, and, as in the case of Hamlet, the pursuit of justice and revenge. In pathopleiosis the outstanding motives are the acquisition of money in the form of damages, compensation or sickness insurance, the escape from legal entanglements likely to result in financial loss or punishment, the desire for sympathy, the escape from distasteful social, domestic, sexual and occupational relationships. In pathomeiosis all the great dynamic motives with the possible exception of the craving for sympathy may form the groundwork. Among nervous people who have inherent fears of death and sickness there is often a tendency to seek solace in an endeavour to negate their fears on religious grounds and so the promulgation of religion becomes a powerful motive in establishing a pathomeiosis. Such people are also pathomeiotic if by force of circumstances they become subjected to the necessity of therapeutic measures involving discomfort of body and uneasiness of mind, more especially if in the process some secret vice or ailment, or entanglement be revealed.

The psychological basis of scoliopathexis having thus been summed up, though admittedly and necessarily in an incomplete manner, there remains yet the need of giving some consideration to the actual practical relationships of the work-a-day world. In this the concept of "compensation" looms large, and, as pointed out a few years ago by Sir Farquhar Buzzard, there is intimately associated with this an ever increasing sense of heteroresponsibility. This product of our complex civilization is found in its most luxurious form in the following relationships: (1) Suits for damages against corporations, professional men, and wealthy individuals; (2) claims under the Workmen's Compensation Act; (3) claims upon sickness and accident liability insurance companies; and (4) claims upon governments for pensions for disabilities alleged to be due to war service. The pinch of economic conditions has led to a great increase in such claims. Lawyers, doctors and medico-legal experts are especially cognizant of the correlations of these activities with the problems of pathomimesis and pathopleiosis. Judges, juries, commissions, and tribunals are beset with difficulties in assessing the amount of actual disability that exists under a tremendous fabric of imitation and exaggeration. In many cases these difficulties are so great that the claimant gets the bulk of the sympathy while the defendant pays through the nose. From the point of view of taxation alone it behooves our profession to seek ways and means for more exact methods of establishing the extent of disabilities, in order that the aforesaid judges, juries, commissions and tribunals may not be over generous in their awards. The reason for such action is quite apparent in the intensity of the strain that is being put upon industry in particular and upon the taxpayers in general. Labour says "Make industry pay to the full limit of its resources." Industry says "Reduce our obligations or we shall go out of business and labour will be unemployed." It would seem, therefore, that we have in this impasse a partial explanation at least of bad times, diminished production, unemployment, diminished purchasing power and therefore diminished demand. Our altruism is killing the goose that lays the golden egg, and it may be that we shall have to revert to a more rugged outlook upon life and its obligations in relation to the individual. The biological result of the demasculinization of man is social chaos. Thus it may be well to pause and ask ourselves wherein lies our responsibility as the medicine men involved in the situation? We can hardly escape the recognition and acknowledgment of our tremendous responsibilities in bolstering up the state in its hour of need. It may also be admitted that a very large element of the remedial process lies within our hands. And how?

1. By a rigid sense of responsibility in lifting our patients out of their disabilities at the earliest possible date and before they have lapsed into the mire of scoliopathexis.

2. By a firm resistance to the temptation of seeking undue rewards from a situation that is largely under our command.

3. By the discouragement of the sense of heteroresponsibility that is so liable to complicate recoveries and induce an obstinate form of scoliopathexis.

It is to be remembered that the attitude of the physician or surgeon first in attendance upon a case of trauma has a tremendous effect in the creation or prevention of scoliopathexis. One

indiscreet remark may lead to a prolonged or unnecessary removal of an individual from his work-a-day environment, with consequent economic loss and drain upon the funds of industry and government. It is a pathetic picture when we see a strong, rugged man demasculinized by a relatively slight disability, through failure to apply a little optimistic psychology at the psychological moment. A word or gesture at the right instant may prevent a long chronic disability, largely endogenous, that for the want of such timely influence may require weeks, months or years to rectify. Is it not our duty, therefore, to refrain from heaping pity, sympathy or blame upon our scoliopathectics? Is it not rather our duty to dissipate fears and anxieties and to restore the patient to his optimum at the earliest possible moment?

Having outlined the general principles of our responsibilities, it may not be amiss to consider in some detail a few of the manifestations of scoliopathexis in order that we may be on the alert to recognize them and nip them in the bud. Pathomimesis, for example, consists mainly in a variety of complaints whose logical coherence depends very largely upon the wits of the subject himself. Objective manifestations may be offered, but as a rule they do not ring true and do not constitute a clinical entity in keeping with the complaints. The disparity is usually rendered apparent by adroit procedures such as the taking of careful notes of subjective and objective findings and at a later date, or perhaps later in the same day, repeating the whole procedure. The careful delineation, on paper, of areas of pain and alleged tenderness, together with a searching cross examination regarding each complaint will usually reveal the underlying incoherence. Pathomimesis, apart from self-inflicted injuries, is usually practised in relation with parts of the body that are not readily available for careful scrutiny. In the nervous system we may have to deal with alleged pain and tenderness without demonstrable evidence of an accounting lesion. There may be incongruous paralyses, disturbances of vision and hearing, headaches and dizziness, convulsive fits, psychotic demonstrations with unreasonable gestures. In the locomotor system, the outstanding syndrome is that of the lame back, but other joints and muscles may be selected. Caution is particularly indicated in the management of back injuries. It has been stated that the practice of informing patients with injured vertebræ that they are suffering from "broken back" has cost corporations and governments millions of money that might have been saved by a more judicious use of words. In the scientific sense such a term as "broken back", applied to slight crushes of vertebral bodies, or fractures of transverse processes or spines of vertebræ, is a misnomer and is entirely misinterpreted by the lay mind. It is undoubtedly a fact that radiological discoveries of such conditions have in innumerable instances led to undue anxiety on the part of both physician and patient and in a very considerable proportion of such cases, the conditions are congenital or existed prior to the trauma that brought them under scrutiny. In the alimentary system, persistent vomiting, vague abdominal pains, air-swallowing, diarrhœa, and alleged bleeding hæmorrhoids, constitute common forms of pathomimesis. In the genito-urinary system, incontinence, polyuria, and glycosuria were frequent manifestations in the late war. In the respiratory system, shortness of breath, hacking cough, and pain in the side are exploited as symptoms. In the circulatory system, fainting fits, palpitation, and cardiac pain that is not cardiological, are put forward as distressing features. In the skin, ulcers and burns, old scars, and unprecedented lesions made by artifice may be turned to account. In the vague field of metabolism, the most usual symptom is a consistently elevated temperature, which undergoes crisis when personal professional scrutiny is given to the technique of using the thermometer. So much in the matter of pathomimesis.

In pathopleiosis we have a more definite clinical entity to deal with and there is usually a demonstrable lesion with which the subjective symptoms are quite out of proportion. A case in point was that of a workman who had had a simple fracture of the fibula, and when the time came for him to return to work, he presented himself before a Board with six heavy socks on the corresponding foot and a complaint that every time he took a drink of cold water it went to his leg. In comparing pathopleiotics with others suffering from similar lesions, we find that the former are overburdened with subjective symptoms, while the

latter are relatively free from such and quickly regain an excellent degree of function, even in the event of relatively severe injuries or disabilities.

Our third entity, pathomeiosis, usually presents a readily detectable lesion or disease, important or unimportant, which the patient minimizes by word, but makes manifest on submitting to examination. Possibly the circulatory system is the one chiefly abused in this respect. Every experienced physician has encountered the difficulties of keeping ambitious heart cases within the limitations of their cardiac reserve. Metabolic diseases, endocrine disturbances, such as exophthalmic goitre, renal disease and venereal diseases are similarly subject to dissimulation and disregard. Diabetics may prefer sugar in their tea and absent treatment to insulin. Nephritics deliberately replace milk and vegetables with beer and cheese. Phthisical patients affect night life and "whoopee" in preference to sunlight and restfulness. Syphilitics tempt the gods with dissipation, physical strain and mental stress, rather than follow the simple life. A one-armed man may play plus four golf while another man with a missing digit would gladly retire from work or play for the balance of his three score and ten. In pathomeiosis there is an element of courage, even heroism, amounting at times to foolhardiness, that is conspicuously lacking in pathopleiosis. It would seem that there is an unequal distribution of caution and ambition in the minds of men, and it lies within the province of our profession to redistribute them, and for this reason it is of the utmost importance that the medical man shall endeavour to make a correct assessment of the physical and emotional factors, not forgetting the great dynamic motivities that exist in such varying proportions in disabled people. Without such care in assessment, treatment and disposal are bound to suffer in proportion.

In pursuance of this doctrine, it is of paramount importance that we should be familiar with the commoner post-traumatic reactions which are so frequently relegated to the internist when a surgeon fails to correct them or is surfeited with intangible complaints. It may be superfluous to review the following truisms. Wounds may leave painful cicatrices. Contusions may leave chronic fibrositis with attendant pain. Dislocations may leave weakened ligaments, which when stretched cause pain. A gradually developing osteo-arthritis may follow. Fractures may involve nerves, with resulting atrophy of muscle, paralysis or paresis of muscle, hyperæsthesias, anæsthesias or excessive callus, the latter limiting the function of neighbouring joints. Burns may leave painful contractions. Frost bites may leave a defective local circulation. Electric shocks usually leave nothing but incoherent subjective symptoms and a craving for pecuniary solatium. Gas-poisoning may leave an anxiety state. Submersion, suffocation and smoke inhalation may leave profound fear memories, and concussion may leave a syndrome of headaches, treacherous memory, dizziness, and general maladaptation, including a seriously reduced tolerance of alcohol. In patients of a naturally rugged outlook these effects are readily overcome and quickly reduced to a minimum, but in those patients who are maladapted at the time of a mishap there is the greatest danger of the growth of a huge fabric of disproportionate disability which unfortunately is too frequently enhanced by the prospects of pecuniary solatium. It is self-evident then that it is the duty of medical attendants to adopt at the outset an attitude of no uncertain optimism in order to consolidate the therapeutic management of the trauma itself.

If, as it has been facetiously stated, doctors are of two kinds, "wind-uppers" and "pooh-poohers," it were better that pathopleiotics shall fall into the hands of the pooh-poohers. The existence of the wind-upper is only justified in certain cases of pathomeiosis, but even in these there is an ever present danger of converting pathomeiosis into pathopleiosis. As a profession we resent this facetious classification, that emanated from a sand-beach flapper, and we assert ourselves as being so disciplined that wind-upping and pooh-poohing shall be applied only *pro re nata* and *pro bono publico.*

Another important precaution of the medical attendant in cases of injury is to search for pre-existing foci of infection and to recommend the early removal of these sources of perpetuated disabilities. The co-operation of the dentist, the rhino-pharyngologist, and quite

frequently the urologist, may save months or years of invalidism following trauma.

Moreover, in order to facilitate the return of disabled, disillusioned, disgruntled and disoriented people to useful activities, a practical knowledge of functional tests is of the greatest importance. These are calculated to substantiate the genuineness or to unearth the falsity of scoliopathectic representations and demonstrations. These tests require careful judgment and technique if they are to be conclusive and convincing. They are to be utilized for the sole purpose of ascertaining facts wherein the examiner should school himself in the rôle of an animated sphinx. It is fatal to give even the most unabashed pathomimetic an impression that he is suspected of malingering. Even though such a diagnosis is apparent, it is rarely the duty of the doctor to adopt a punitive attitude. While we recognize that malingering, as such, is an indictable offense, and that only fear of the law prevents a more widespread practice of the art, we must be alive to the fact that these points are more applicable to European than to western civilization, inasmuch as there are so many more unemployed and unemployable on the other side of the ocean. The discovery of a pathomimetic should be accepted by an examiner with equanimity and without visible emotion. If a report is to be given, the fact may be stated and the matter may be left in the hands of others for punitive action. The examiner is well repaid in the knowledge that he is preventing an injustice.

Owing to the high cost of sickness it would seem that a new form of paternalism may be inevitable in our land. The panel system of Great Britain was designed to cover this contingency, but statistics would indicate that it is too expensive a luxury in its *modus operandi*. For the present, therefore, it behooves us to acquaint ourselves with the abuses of the system in order that we may be able to cope with them when overtures for state medicine are thrust upon us. Under the panel system valetudinarianism has apparently increased, while the traditional phlegm of the British workman is being undermined by a process of psychic softening. Medical certificates of ill health are given too freely. Panel doctors are compelled to be over generous in this respect, lest they provoke sinister criticism and lose their appointments. Illnesses are lengthened, convalescences are prolonged. It has been found that a workman has frequently a larger income when ill than when he is at work. Is it any wonder then that the good old British phlegm is breaking down and that the stuff that made our Empire is like to be lost in the great work of its preservation? Pity 'tis that the process should invade our virile shores. There is an alarming tendency here at present to attribute all disabilities arising in the day's work to accident. Little account is taken of underlying constitutional disorders common to all classes of society. It is feared that unless this attitude is modified, industry will be forced to protect itself by examining all its men for physical fitness prior to taking them on its pay-roll, and at intervals thereafter. This would mean the elimination of a large number of men of poor physique and increasing age, followed by an increase of unemployment and the unemployable. One sociological extreme results in militarism, the other in communism. The middle course is undoubtedly the one for us, and it is fair to state that the responsibility for its preservation is largely in the hands of the medical profession, in that we must undertake to carry the burden of a great national duty by strict attention to the technique of reinstating disabled men in their occupational activities in a minimum period, and influencing them in turn to realize their responsibilities to the economic world. In Belgium there exists a measure whereby compensatability is restricted to a limited period and a knowledge of this fact prevents a great deal of scoliopathexis in that country.

Another factor in our unemployment problem that has not been given much thought is the advent of women into the pursuits of men. This influence has naturally led to a demasculinization of industry and in consequence many idle men drift into the paths of least resistance, a process that does not make for the conservation of that male robustness of other times. Pathopleiotic men are often content to march with the unemployed or sit at home drawing a small pension for a minor disability, while wives and daughters carry the responsibility of the household. In our country of unbounded possibilities there is plenty of outlet for this group of superfluous men. It lies in a re-

juvenation of the spirit of legitimate adventure and pioneering to replace the decadence of ease and luxury. Our forefathers had no paternalistic props in the early days of our national life. With them it was a case of "root hog or die", so they rooted.

It is a matter of interest and wonder how patients recovering from trauma and receiving compensation for a period of weeks and months spend their time. It is usually admitted by them that they "sit around and read and smoke." Could any regime be better calculated to undermine the morale of wage earners, especially if a wife and other members of a family logically enough complain of the meagreness of the compensation and the injustice of human affairs in general. It is in this respect that occupational therapy offers much hope of reformation. There is no good reason why the majority of partially disabled men should not seize upon a period of invalidism to do some constructive thinking and improve their capacities as wage earners as well as increase their scope of advancement in the industrial world.

Pathomimetics and pathopleiotics existed in considerable numbers in the armies of the Great War. The battalion medical officer had his problems in this connection. Personal experience of this situation taught that the best means of dealing with it consisted in stripping the soldier on sick parade, giving him a careful physical examination, and, nothing of importance being found, in sympathetically but very firmly assuring him that he must return to duty without the slightest fear of endangering his health. It may be put down as axiomatic that everyone appreciates a square deal and taking pains with complaining soldiers and workmen is the right way of giving them a square deal. It is fair to assume that a considerable degree of pathopleiosis is engendered by perfunctory methods on the part of the busy practitioner. Thus patients are permitted to drift in the Slough of Despond.

This large subject of scoliopathexis may be epitomized in a few more or less dogmatic statements. Scoliopathexis is a disability, but not a pensionable or compensatable one. It can be largely prevented by mental hygiene and psychotherapy administered early and often in case of trauma and disease. Surgeons should not be content to leave this form of therapy entirely to internists and neurologists, but should include it as a fundamental measure in their therapeutic armamentarium. A knowledge of the practical workings of such important statutes as the Workmen's Compensation Act should be included in the curricula of the medical schools in order that future cooperation of the profession may be assured. Practical demonstrations might well be included in medical curricula in order that the profession may give satisfactory expert evidence in law courts. Practical psychotherapy and mental hygiene should be given a place in the teaching of clinical therapeutics. It is believed that such a step would bring the profession and the laity nearer to a mutual understanding, thus giving a death-blow to the cults of irregular medicine. The increase of scoliopathexis, especially in the pathopleiotic form, is worthy of profound consideration by the profession from the more national point of view of unemployment and throttled industry. The legal discontinuance of pensionability for the so-called neuroses would probably lead to great economic saving and to the elimination of the great deal of valetudinarianism that frequently masquerades under a more euphemistic name. Such would necessitate more definite clinical grounds as a basis of compensation, and incidentally the pathomimetics and pathopleiotics would be forced into a more rugged outlook upon life. The erroneous concept of *post hoc ergo propter hoc* should be discountenanced emphatically by the profession, in order to clarify medical disabilities in the minds of judges, juries, commissions and tribunals. The medical profession should be prepared to stampede this concept when it crops up in compensation-conscious patients.

Finally, it must be reiterated that our profession should realize its ever increasing responsibilities to the state. With the evolution of human progress and the augmenting complexity of civilization, medicine is becoming a nobler and nobler calling. Trained in the study, recognition, and treatment of abnormalities in the individual, the medical man is ever finding his scope enlarged to embrace the social ills and buffets of mankind. May it not be said that he is much more than

the *flower;* that he is indeed the *guardian* of our civilization?

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LEUCORRHŒA*

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THE treatment of leucorrhœa is in many instances very difficult both for the general practitioner and for the gynæcologist. In the discussion of this paper only a few of the known causes will be touched upon. One cause for difficulty may be the general condition of the patient. Patients with anæmia or general debility of any kind may develop leucorrhœa, and this applies especially to young girls. Sometimes there may be an endocrine disturbance. One has to be careful in this class, however, not to overlook a local condition of the cervix which may have developed. A very common cause for leucorrhœa is a gonorrhœal infection. Here one gets evidence of infection in Skene's tubules, in the Bartholinian ducts, in the urethra, and in the cervix.

The urethra should be treated until there is no pus present after massaging the floor of the urethra through the vaginal wall. One must bear in mind, also, that occasionally a stricture in the urethra may occur and that this will have to be treated by dilatation. The failure to pay sufficient attention to the urethra is the cause of reinfection in many cases. I have one patient in mind now who had had at least three different attacks owing to the fact that the urethra had never been treated. This woman had a well developed stricture in the urethra and following dilatation the condition rapidly improved.

Even after the slides from the cervix and the urethra are negative it does not necessarily follow that the condition is cured. The treatment will have to be directed to the urethra, to Skene's tubules, to the Bartholinian ducts, to the cervix and to the tubes, if necessary. I very rarely find it necessary to remove the tubes in cases of gonorrhœal infection, especially in young women, because most of these cases can be made very comfortable under treatment. There are very few of these cases from the "outpatient" department that have had to be operated on in the last few years. As a matter of fact the patients who have been operated on are those who are most difficult to relieve. If it is necessary to operate I am in favour of being rather radical, removing both the tubes, and perhaps the ovaries, and nearly always part or all of the uterus.

Another group of cases comes under the heading of infections of the cervix. Here one may have a simple erosion or laceration, or a chronic inflammation of the cervix, with or without cyst formation. The use of the electric cautery will, in most cases, clear up this condition. Since employing the electric cautery I do not find it necessary to operate as often as I did some years ago. One should use the electric cautery, even though the woman is pregnant. I have not seen any ill effects from this up to the fourth month of pregnancy. It is possible that one may remove a focus of infection which might flare up after delivery.

The cervix should be carefully inspected after delivery in every case and if a deep laceration is present it is best to have it repaired immediately. Certainly no woman should be discharged after delivery until one has examined the cervix at the end of the sixth week. Every patient should be told that it is not natural to have a persistent leucorrhœa, and she should be advised to have a pelvic examination if such a condition occurs in the future, and more especially at the time of the menopause. I believe that more

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careful attention to the cervix will cut down the incidence of cancer in the years to come.

Chronic cervicitis may also be the cause of pain in the lower abdomen, which may be relieved by clearing up the condition. Unfortunately, some of these cases are operated on because the surgeon is not aware that the pain may be caused by pelvic cellulitis secondary to chronic cervicitis. Occasionally chronic cervicitis may act as a focus of infection and cause trouble in other parts of the body. One must be careful, however, not to think that every cause of chronic cervicitis is necessarily acting as a focus of infection. For the more severe cases of laceration or infection of the cervix it may be necessary to operate and I believe that the Sturmdorf operation is excellent here. Following this operation there should be very little mucous membrane left behind in the cervix.

There is another cause for leucorrhœa that is not receiving the attention that it should from the general practitioner, and that is the *Trichomonas vaginalis*. This organism causes a foamy discharge, slightly tinged with yellow, which in many women is very irritating. The irritation is most marked at the end of the menstrual period and one is more likely to find the organism at this time.

The *Trichomonas vaginalis* is a pear shaped organism, usually larger than a pus cell, although varying somewhat in size. It has four long flagella springing from its anterior pole and a short tail-like process extending from its posterior pole. The organism is propelled quite rapidly by means of the whip-like action of these flagella. The flagella can seldom be detected in fresh preparations unless the organism is in motion.

I have discovered this organism in many pregnant women and also in nulliparæ and multiparæ. I found it on one occasion in a girl sixteen years of age, and this case was very difficult to treat.

We do not know definitely where this organism comes from, nor are we sure that it always causes symptoms in every woman. It is supposed by some to come from the bowel. In order to clear up the condition ordinary tincture of green soap is used to scrub out the vagina. The vagina is then dried and a tampon soaked in boroglyceride is inserted. It is best to give a series of treatments using this technique. The patient is advised to wash off the vulva once a day with tincture of green soap. Also, a lactic acid douche should be taken once a day, using one teaspoon of lactic acid to one quart of water. The patient is then examined at the end of the menstrual period and slides are taken. If no organisms are present after three periods one is fairly safe in discontinuing active treatment. A certain number of these cases, however, will have recurrences.

There is still another cause for leucorrhœa and up to the present time not much attention has been paid to it. It is the monilia or yeast fungus. The yeast fungus may be present without causing any symptoms. As a rule it does not cause much discharge, but the reaction of the vagina is usually highly acid. This infection may also be present in pregnant women. Parous women are more often infected than nulliparæ. The symptoms caused are itching, burning and smarting of the lower vulva and vagina. Digital examination, speculum examination, and sexual intercourse may be painful. The organism may be found by the ordinary examination under the microscope, or one may stain it. It may also be grown in culture. The treatment recommended is 1 per cent gentian violet in aqueous solution. Alkaline douches are also advised.

TREATMENT OF ATOPHAN POISONING.—K. Eimer records the case of a man aged 52, who received large doses of atophan (118 grams in 41 days) on account of chronic rheumatism. During the treatment he became very ill; there followed severe jaundice, with tenderness and enlargement of the liver, and a rash which in places was definitely hæmorrhagic. The urine contained bilirubin, and a trace of albumin, but no urobilin, tyrosine, or leucine. The fæces were pale, and contained no bile or hydrobilirubin. The coagulation time of the blood was somewhat increased (7 minutes), the bleeding time being normal. The van den Bergh test gave a positive direct reaction. During the period of serious illness the nitrogen excretion was very high (15 to 18 grams daily), denoting a marked breakdown of tissue proteins. As soon as the symptoms developed, atophan administration was discontinued, and 60 grams of dextrose and 20 units of insulin were given twice daily. Later on, duodenal lavage with magnesium sulphate solution was also instituted. The patient slowly recovered. The author believes that the energetic treatment used in this case was connected with the favourable result.—*Deut. med. Woch.*, Sept. 25, 1931, p. 1663.

ACUTE APPENDICITIS*

(A STUDY OF 401 CASES),

BY JAMES McKENTY, M.D., F.A.C.S.

Winnipeg

ACUTE appendicitis, since Fritz's classical description in 1886, was for twenty years the subject of discussion at meetings and in journal articles more frequently than probably any other disease. After 1910 the interest in the subject waned until discussion was revived by the publication of statistics showing a steady increase in the death rate. In the United States registration area an increase from 11.6 in 1911 to 15.2 in 1929 per 100,000 population has occurred. In Manitoba the figures for the ten-year period 1921 to 1930 show a total of 825 deaths, approximately 12.5 per 100,000 of population, annually. Its high standing among the causes of death during the first half of life and its wide diffusion among all classes make it a subject of constant interest to all practitioners.

My list of 401 consecutive cases is small in comparison with many published lists, but inasmuch as they were all private cases it is likely they received more careful study than the larger lists composed of hospital cases only. The salient features are presented in the following tables.

TABLE I

PATHOLOGY OF 401 CASES

		%
Not ruptured	148	36.9
Ruptured, free pus without peritonitis	19	4.7
Abscess with limited peritonitis	177	44.0
Diffuse peritonitis		
primary	40	
secondary	17	14.2

In the "not ruptured" cases some peri-appendicular exudate was frequently present. Sixty-eight per cent came to operation within the first three days.

TABLE II

ADMITTED TO HOSPITAL BEFORE THE END OF THE THIRD DAY

		%
Of the 148 not ruptured	104	70
" " 19 free pus without peritonitis	16	84
" " 177 abscess with limited peritonitis	38	21
" " 40 primary diffuse peritonitis	10	25
" " 17 secondary diffuse peritonitis	0	0
401	160	41

The group of those with free pus without peritonitis is made up of 19 cases operated upon within a few hours after perforation had occurred and before peritonitis had time to develop. As the ordinary pyogenic germs require from six to twelve hours to become domiciled upon and excite an inflammatory reaction in living tissue, the peritoneum in such cases may be considered contaminated, but not yet inflamed. The retention of its normal lustre was accepted as evidence of the absence of inflammation in these cases. More than 80 per cent of this group came to operation within three days.

The group of 177 cases with localized peritonitis or abscess, amounted to 44 per cent of the total. Only 22 per cent were admitted within the first three days and 44 per cent not till after the end of the first week. The pathological change in these cases varied from a small quantity of pus enclosed along with the appendix in a fold of omentum up to large abscesses whose walls were composed in part by loops of ileum. Many in this group were highly toxic.

The group with diffuse peritonitis was composed of 57 cases, 14.2 per cent of the total. A study of the clinical history, physical examination and operative findings revealed evidence that in 17 the infection had been localized for some time, often for several days; then as a result of tension within the abscess or of active peristalsis, excited by purgatives or some other indiscretion, a leak and widespread diffusion of septic material occurred. The resulting pain then brings the patient to hospital. The records show that more than 80 per cent of the 17 were not admitted until after the first week.

In the primary form evidence that the infection had for a time been localized is entirely wanting. Also, nearly all of these were admitted to hospital within the first week, 10 during the first three days.

TREATMENT

Table III gives the treatment carried out and the result in each group.

* Read at a meeting of the Manitoba Medical Association, September 8, 1931.

TABLE III

No. of cases			*Mortality*	*%*
148	not ruptured, appendectomy in all		1	
19	perforated, free pus, appendectomy in all		0 —	0.6
177	abscess cases			
	appendectomy in 146		2	
	drainage only in 31		2 —	2.2
57	diffuse peritonitis:			
	(a) Primary 40			
	Ochsner appendectomy and drainage	7 –	2	
	Ochsner and drainage only	3 –	0	
	appendectomy and drainage	27 –	6	
	drainage only	3 –	3 —	27.5
	(b) Secondary			
	drainage only	11 –	5	
	appendectomy and drainage	6 –	3 —	47.0
401			24	5.9

In groups 1 and 2, comprising 167 cases, operation was performed immediately after admission to hospital in all, with one death, a mortality of 0.6 per cent. In this type of case surgical opinion is unanimous regarding the advisability of immediate operation; 12 of the 19 perforated cases were drained for 24 hours, a procedure which I now think was probably unnecessary.

In group 3, comprising 177 cases of localized peritonitis and abscess, operation was also performed without delay, the appendix being removed in 146 with 2 deaths, and a drainage operation only performed in 31 with 2 deaths, a mortality of 2.2 per cent for this group.

A study of the literature shows that immediate operation is the treatment adopted by the great majority of surgeons on this continent and in Great Britain for the type of cases included in this group. There are however, a few men of great experience who delay operation until the abscess becomes absorbed. This practice was more widespread last century than it is at present. Until some means of effectively neutralizing the toxins absorbed into the system is found, it seems more rational to drain the appendiceal abscess as we would drain abscesses in other situations. In my experience also it is not uncommon to find a degree of tension within the abscess sufficient to cause a spurt of pus several inches high. In such cases it is surely imperative to establish drainage promptly. On the other hand, in cases in which the mass is decreasing in size and the systemic symptoms subsiding, a waiting policy may be safely adopted. Rayner[1] treated 52 cases of localized infection along the line of delay with 3 deaths, a mortality of 5.7 per cent. The advocates of delay in this class of case have not yet shown results as good as those following immediate operation.

Whether to remove the appendix or limit the operation to drainage calls for the exercise of judgment that can be only acquired by experience. Deaver[2] says it should not be necessary to leave the appendix in more than 2 to 5 per cent of all cases. In the 177 cases here studied the appendix was not removed in 31 or 17.5 per cent.

Group 4—diffuse peritonitis—57 cases—14.2 per cent of the total. The incidence of this complication in published lists varies from 5 to 20 per cent. I have divided this group into 40 primary and 17 secondary cases. This differentiation is rarely recognized in published reports, yet I am convinced that it has considerable value in prognosis and treatment. In the secondary form, which results from a leak from a localized abscess, the indications for prompt drainage, preferably under local anæsthesia, are imperative. A mortality of 47 per cent in these 17 cases is evidence of the gravity of the prognosis in this type, due, no doubt, to the lowered resistance of the patient resulting from toxæmia usually of more than a week's duration.

A study of the literature shows that approximately 60 per cent of all deaths from appendicitis are due to diffuse peritonitis. The management of this complication therefore is undoubtedly the most important problem in appendicitis. A marked feature of the literature also is the wide diversity of views and of practice among surgeons of the largest experience upon this continent and in Europe and the British Isles regarding the treatment of this complication. In their attitude towards diffuse peritonitis of appendiceal origin surgeons may be divided into three groups.

The first group are those who operate immediately upon all except moribund cases. These constitute, I think, the largest group upon this continent and include also, probably, the majority of British surgeons. Among them there is nearly complete agreement that drainage without appendectomy is inefficient and that removal of the source of infection—the appendix—is the essential part of the operation. The mortality from this practice as given in published statistics varies from 15 to 80 per cent. This wide difference in results is no doubt due chiefly to differences among

clinicians as to what signs and symptoms warrant a diagnosis of diffuse peritonitis. In 13 different reports in which the mortality of diffuse peritonitis is given separately I find a total of 946 cases subjected to immediate operation with 299 deaths—a mortality of 31.9 per cent.

The second group, those who delay operation, and, after the method introduced by A. J. Ochsner, some thirty years ago, and James Sherren, adopt a plan of treatment designed to induce subsidence and localization of the inflammation. Underlying this plan of treatment is the old established principle of rest for inflamed tissue. This rest is secured by emptying the stomach by means of the stomach tube and by prohibiting the oral ingestion of anything, even water. Sherren[3] and his followers give water freely by mouth. If the tract is kept empty peristalsis and the cramps resulting from it soon cease and morphine is rarely required. Since its introduction this method has been improved by the addition of Fowler's position, Murphy's rectal drip, and other means of introducing into the system the saline and glucose solutions which recent investigations have shown to be badly needed. This physiological rest treatment, plus hot fomentations to the abdomen, is continued until the peritonitis quiets down or becomes localized, when a drainage operation may be done, and, in some cases, the appendix may be removed. From one to three weeks is required before operation can be safely undertaken. Most of the fatalities from diffuse peritonitis occur during the second week. When this treatment succeeds improvement begins promptly; no improvement after three or four days indicates a fatal issue which Deaver[4] says, will only be hastened by operation. This is the plan of treatment adopted by those surgeons on this continent and Great Britain who delay operations in diffuse appendiceal peritonitis. They do not make up the largest group, but their number has, I think, increased considerably during the past decade and among them are the names of some of the most eminent British and American surgeons.

The mortality from this plan of treatment is not known. A fairly thorough search of the literature finds only two reports bearing upon this point. The first is in Ochsner's "Clinical Surgery".[5] This distinguished surgeon records "acute appendicitis with diffuse peritonitis, 33 cases with 10 deaths," a mortality of 30 per cent. Ashhurst[6] reports 37 cases with 13 deaths. These, with my own 10 cases with 2 deaths, make a total of 80 cases with 25 deaths, a mortality of 31.2 per cent. This is much too small a number on which to base a conclusion. We need the results obtained by many different surgeons in a total of at least 500 cases before the mortality with this plan of treatment can be definitely known. Several surgeons who adopt this method have published valuable articles, but in none of them have the statistics for diffuse peritonitis been given separately. Love[7] says: "It is perhaps particularly in cases of general peritonitis that delay is valuable," but of the 341 cases treated on delayed lines which he presents the number with diffuse peritonitis is not given, and as the followers of the Sherren school delay operation in all cases in which cutaneous hyperæsthesia has disappeared it is possible that these 341 were mostly cases of localized peritonitis. His statistics therefore do not help to decide whether delay is valuable in general peritonitis or not. Jopson and Pfeiffer[8] make the statement that the statistics now available do not help in determining the best plan of treatment. In this I heartily concur, and would suggest to those holding hospital appointments that a study of their clinical material would help materially in the solution of this problem.

The "opportunists" is a term applied to those surgeons found chiefly in the large centres of Europe who in their treatment of appendicitis complicated by peritonitis cannot be placed in either of the two preceding groups. Among them there is no uniformity in procedure, the reasons for either delay or intervention being various and often conflicting. Some delay as long as the case is progressing favourably and resort to operation when signs of diffusion of the peritonitis appear, a practice directly contrary to that of those who follow the lead of Ochsner and Sherren. The mortality of the "opportunists" in any particular type of acute appendicitis is impossible to ascertain.

From this survey of the literature, it is evident that the surgical world is in complete agreement upon only one point in the treatment of appendicitis, *i.e.*, that immediate operation is advisable in all cases in which the evidence

supports the view that the inflammation is still limited to the appendix. That time is not an adequate measure of pathology is evident from the fact that of the 148 not ruptured cases in my list, 44, or a little more than 10 per cent of the total, were admitted to hospital after the third day. Many British surgeons emphasize as a diagnostic feature the persistence of a zone of cutaneous hyperæsthesia as an evidence that the appendix is still intact.

Agreement is also fairly complete regarding the advisability of prompt surgical intervention in cases with abscess or localized peritonitis. Here agreement ends. Regarding the type complicated by diffuse peritonitis which destroys more lives than all the other types together, there is widespread diversity in both teaching and practice. You can find in the literature the sanction of authority for any plan of treatment you may please to adopt. We have already considered the methods and results of the two schools, the immediate interventionists and the followers of Ochsner and Sherren. The first have published data showing a mortality of 31 per cent, the second have failed to place before the profession the data necessary for a comparison. Among the rank and file, individual experience is not sufficient to justify conclusions. Of my 40 cases of primary diffuse peritonitis, 30 were operated upon immediately with a mortality of 30 per cent, and 10 were treated after the Ochsner method with a mortality of 20 per cent. Such experience creates an impression favourable to the latter method, but it is only an impression. The masters of surgery who advocate this method have not yet given to the profession the data upon which their conclusions are based.

Those who follow the Ochsner plan of treatment for diffuse peritonitis generally agree that it should not be applied—in children whose powers of localizing intra-abdominal infection are imperfectly developed, and whose alkali-acid balance is more easily disturbed by starvation; when the peritonitis is secondary to the rupture of a pre-existing appendicial abscess; when a perforative lesion of the alimentary tract cannot be positively excluded.

Many authorities, including Ashhurst and Deaver, advise immediate operation in those cases of diffuse peritonitis in which abdominal rigidity is still present. When this rigidity gives way to distension, they advise the physiological rest treatment of Ochsner.

ENTEROSTOMY

Whether immediate appendectomy or the Ochsner method be adopted, the ileus so commonly associated with peritonitis demands attention. Probably the most important factor in the fatal issue is absorption of toxin from the lumen of the paretic bowel. Drainage of the proximal segment that still retains some peristaltic power is therefore an urgent indication. The Ochsner plan of treatment endeavours to meet this indication by gastric lavage. I have performed enterostomy in more than 50 cases with peritonitis due to various causes and believe that it is a much more effective method of draining the proximal segment than gastric lavage. The making of the stoma under local anæsthesia is also less distressing to most patients than the use of the stomach tube. In cases of obstruction due to involvement of a loop of lower ileum in localized peritonitis, enterostomy is the urgent operation. Appendectomy and drainage of the abscess may be delayed until hypochloræmia and dehydration have been corrected.

Table III shows that in 48 cases a drainage operation only was done. Of the 38 surviving, the appendix was removed before the patient left the hospital in 4. Of the remaining 34, 8, or 23.5 per cent, are known to have required appendectomy later for recurrence of symptoms; 6 are known to have remained well, and 20 have not been traced. Homans,[9] after a study of the literature, came to the conclusion that about 20 per cent will have recurrence after drainage operation only.

THE MORTALITY

Eighteen reports published since 1920, several of them during the last five years, by 13 American and 5 British surgeons, yield a total of 17,916 cases with 1,084 deaths, a mortality of 6 per cent. Some of these reports give the mortality for the different types of appendicitis. A study of these leads to the conclusion that the average mortality among British and American surgeons in uncomplicated cases is 0.5 per cent; in cases with local peritonitis and abscess, approximately 3 per cent; and in diffuse appendiceal peritonitis, 31 per cent.

Of the 24 fatalities in my list, 19 were due to diffuse peritonitis. The primary form killed 11, 8 from toxæmia between the 6th and 14th days and 3 from sepsis and intra-abdominal residual abscess during the second month.

Peritonitis secondary to the rupture of a recently localized infection accounts for 8 deaths—5 of these followed in from 12 to 40 hours after the rupture of the abscess, death being evidently due to the absorption of an overwhelming dose of toxin. The other 3 died during the third month from sepsis associated with intro-abdominal abscesses, and in one case a portal phlebitis.

SUMMARY

A study of 401 consecutive cases is presented showing satisfactory results in the uncomplicated cases and in the cases with localized peritonitis and abscesses, and unsatisfactory results in 57 cases of diffuse peritonitis.

A review of reports published since 1920, covering 17,916 cases, shows that among British and American surgeons the average mortality is 6 per cent and that 60 per cent of the total deaths are due to diffuse peritonitis.

Immediate operation in diffuse peritonitis of appendiceal origin has a mortality of 31.9 per cent.

Whether the results under the Ochsner-Sherren plan of treatment are better or worse cannot be ascertained from a study of the literature. The followers of this plan have not published statistics which would enable the profession to judge of its merits.

CONCLUSION

The treatment of cases complicated by diffuse peritonitis is the most important problem of appendicitis. For its solution, further clinical research by those who follow the Ochsner-Sherren method of treatment is necessary.

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TREATMENT OF ANTHRAX BY N.A.B.—In your review of the annual report of the Chief Inspector of Factories in the *Journal* of September 12th reference is made to the serum treatment of anthrax. It does not seem to be known in England that novarsenobenzol is a specific for anthrax infection. I do not know to whom the honour is due of introducing this method of treatment to the medical profession in South Africa, but I think I am right in saying that throughout the Union the N.A.B. treatment is the one generally adopted. An intravenous injection of 0.6 gram daily or on alternate days, according to the severity of the symptoms, will not only save the life of the patient, but will render surgical intervention unnecessary in the majority of cases. Furthermore, serum is not always readily available to the general practitioner, whereas N.A.B. forms a part of his ordinary armamentarium.—A. B. M. Thomson, of Durban, in *Brit. M. J.*, 1931, **2**: 921.

CLINICAL FEATURES OF PELVIC ENDOMETRIOSIS.—T. Cuizza, while conceding that no sign or symptom is pathognomonic of intrapelvic endometriosis, holds that a pre-operative diagnosis is sometimes possible. The most constant symptom is dysmenorrhœa, experienced secondarily in adult life. It is very severe, and very resistant to treatment, and is sometimes accompanied by vomiting or rectal or vesical tenesmus. With cessation of the flow, the pain, which has not diminished previously, vanishes abruptly. A moderate degree of menorrhagia is usual, and married patients report dyspareunia. The uterus is somewhat enlarged and has a highly characteristic soft, elastic consistence; it may be retroflexed and may contain one or more myomata. When the ovaries are the site of endometriosis they are found to be moderately enlarged, fixed, and tender. The pelvic connective tissue, especially in the pouch of Douglas, is rigid, although nothing in the history or present signs points to pelvic inflammation.—*Riv. d'Ostet. e Ginecol. Prat.*, August, 1931, p. 328.

A FIVE-YEAR REVIEW OF PULMONARY COMPLICATIONS FOLLOWING OPERATION*

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THE cases herein analyzed are restricted to those dealt with in the main operating rooms of the hospital. It was not thought expedient for the purpose of this paper to include minor operations performed in the surgical and dental outdoor departments, amounting to approximately 9,000 for the five-year period. None of these patients, to the knowledge of the writer, has developed any of the complications tabulated here. In the accompanying table operations have been listed without regard to their nature or to the kind of anæsthetic used. This was thought to furnish the most satisfactory basis for comparison with past and future periods.

On studying these records one is struck by the fact that certain types of patient account with undue frequency for the development of these complications, and this irrespective of the anæsthetic used or its duration. This holds especially true for the fatal types of pneumonia. Indeed the operative risk may be estimated according to the general state of the bodily organs rather than to the severity of the operation proposed.

In the first three years of this record no death occurred from one of these complications in which was not found, either on clinical examination or at autopsy, at least one of the following conditions, malignant disease, peritonitis, myocarditis or tuberculosis. Marked arteriosclerosis was present in 25 per cent of the fatal cases. Cranial injuries accompanied by unconsciousness, and injuries involving fracture of several ribs, are peculiarly conducive to chest complications, encountered even before operation, and although included in this report can hardly be classed under the title of this paper. Industrial skilled or careless hands, in the unwise choice of the anæsthetic where latent or active respiratory infection exists and where modern resources of post-operative care are ignored, no great improvement can be looked for in the future.

TABLE I—PULMONARY COMPLICATIONS

Clinic	*Author and Year*	*No. of Operations*	*Pulmonary morbidity*		*Pulmonary mortality*		*Mortality per cent of morbidity*
			No.	%	No.	%	
Montreal General Hospital	Armstrong, 1906	2,500	55	2.2	32	1.28	58.1
Von Eiselberg, Vienna	Ranzi, 1909	6.871	263	3.8			
Combined Statistics	Von Lichtenberg, 1908	23,673	440	1.9			
Mayo Clinic	Beckman, 1910	3,657	41	1.12	9	0.24	21.0
Mayo Clinic	Beckman, 1912	5,835	92	1.57	6	0.10	6.5
Mayo Clinic	Beckman, 1913	6,825	87	1.27			
Mass. General Hospital	Culter and Mortion, 1917	3,490	65	1.86	33	0.94	50.7
Combined Statistics	McKesson, 1918	39,438		3.03		1.06	
Peter Bent Brigham Hospital	Culter and Hunt, 1920	1,562	55	3.52	11	0.7	20.0
Pittsburgh	Decker, 1921	5,976	69	1.2	20	0.5	42.0
Peter Bent Brigham Hospital	Culter and Hunt, 1921	1,604	63	3.92	5	0.31	7.93
Philadelphia	Ravdin and Kern, 1922-23	5,966	69	1.15	28	0.47	40.6
Geisinger Memorial Hospital	Foss and Kupp, 1926-29	3,433	60	1.70	25	0.72	41.7
Montreal General Hospital	Stewart and Casey, 1929	5,750	44	0.76	10	0.18	23.5
Montreal General Hospital	Stewart and Casey, 1926-1930	27,756	203	0.73	72	0.26	36.7

In the course of an investigation of this nature it is readily apparent that too great importance should not be ascribed to any one single factor in the production of these post-operative sequelæ. Age, sex, pre-operative history, and physical findings influence the final outcome almost as much as the type and duration of the operation. No attempt is made here to minimize the responsibility of the anæsthetist. In un-

* Read before the Lafleur Reporting Society, Montreal, October 27, 1931. From the Department of Anæsthesia, Montreal General Hospital.

TABLE II

THE MONTREAL GENERAL HOSPITAL
POST OPERATIVE PULMONARY COMPLICATIONS

	No. of Operations	*Total P. O. Complications*	*Per cent*	*Total deaths*	*Percentage of deaths to No. of operations*	*Percentage of deaths to morbidity*
1926....	5,024	39	0.78	24	0.48	61.5
1927....	5,394	39	0.72	14	0.26	36.0
1928....	5,666	45	0.79	12	0.21	26.5
1929....	5,750	44	0.76	10	0.18	23,5
1930....	5,922	36	0.61	12	0.20	33.3
Total	27,756	203	0.73 Av.	72	0.26 Av.	36.7

Details	*1926*		*1927*		*1928*		*1929*		*1930*		*Total*	
	Cases	*Deaths*	*Cases*	*Deaths*	*Cases*	*Deaths*	*Cases*	*Deaths*	*Cases*	*Deaths*	*Cases*	*Deaths*
Pulm. embolism.....	1	1	5	2	5	2	1	1	1	1	13	7
Broncho-pneumonia....	25	13	14	7	20	8	17	4	16	7	92	39
Lobar pneumonia.....	4	4	5	1	1	1	11	0	5	0	26	6
Terminal pneumonia....	4	4	2	2	0	0	2	2	2	2	10	10
Bronchitis.....	2	0	11	1	10	0	9	1	9	1	41	3
Lung abscess.....	1	1	1	1	0	0	0	0	1	0	3	2
Pneumo-thorax.....	2	1	0	0	0	0	0	0	0	0	2	1
Pleurisy.....	0	0	1	0	2	0	0	0	0	0	3	0
Massive collapse.....	0	0	0	0	3	1	3	1	1	0	7	2
Ac. tonsillitis.....	0	0	0	0	*4	0	0	0	0	0	4	0
Massive pulm. hæmorrhage.....	0	0	0	0	0	0	1	1	0	0	1	1
Œdema of lungs.....	0	0	0	0	0	0	0	0	1	1	1	1

*Three cases in the same ward at the same time.

and motor accidents are accountable for 12 out of the total morbidity of 203 and of these twelve 10 are included in the mortality list of 72.

PULMONARY EMBOLISM

This complication occurred in 13 cases, with a mortality of over 50 per cent. It frequently followed comparatively minor operations in healthy individuals, such as herniotomy, reduction of fractures of long bones, especially the femur, opening of abscesses, and occasionally after abdominal operations.

The onset is abrupt, with sudden pain and varying degrees of collapse. In fatal cases death is sudden. It occurred as early as the first post-operative day, while at the other extreme a rapidly fatal seizure coincided with the patient's first attempt to get out of bed on the fourteenth day following radical cure of an inguinal hernia under local anæsthesia. Recent statistics would seem to indicate that the proportion of recoveries from this complication, 46 per cent, is unduly high. In one or two of the non-fatal cases where the area of lung involved is small and physical findings are doubtful the sudden onset and characteristic symptoms seem to justify the diagnosis.

It is not within the scope of this paper to attempt to discuss this complication as regards etiology or treatment. Any measures which tend to promote the general circulation should be undertaken and frequent change of posture and moderate movement should be encouraged early in convalescence.

BRONCHO-PNEUMONIA

The high death-rate incident to this type of pulmonary lesion is accounted for chiefly by that class of risk previously mentioned which comes to the table heavily handicapped. This comprises 95 per cent of the fatal cases in this group. Operation is usually imperative, either for the relief of obstruction from a malignant growth or the repair of a perforated viscus. By its nature and site it is of fairly long duration and is accompanied by serious disturbance of the respiratory and cardiac functions. Signs of pulmonary disease are often apparent within a few hours and the prognosis must be guarded. Senility is not necessarily a feature; only 13 per cent of the cases cited here had passed their 60th year.

The non-fatal type of broncho-pneumonia develops most frequently after laparotomy,

especially of the upper abdomen. In the anæsthetic records all operative hazards are divided into three groups, A, B, and C, according to their general condition before operation. These practically without exception fall into Group A.

The duration of this type of pneumonia is often brief, the temperature sometimes subsiding in from two to five days, and the hospital stay is not prolonged beyond the usual post-operative convalescent period. When the complication has arisen late in the convalescence, however, one or two weeks extra in bed is necessary. Empyema as a sequel is a rarity.

It has been generally agreed upon during the past few years that the physical findings in many cases of so-called post-operative pneumonia are due to the presence of atelectatic areas in the lungs. The mucous plug theory of their causation seems reasonable. This does not imply the aspiration and retention of foreign material, but rather an increased bronchial exudate accompanied by decreased ventilation of the lungs. If chronic bronchitis already exists pulmonary stasis is further favoured by the narrowing of the bronchi and the more viscid character of the exudate.

A few well-defined instances of collapse of the lung, diagnosed in the wards and confirmed by the x-ray, are included. May not some of the non-fatal broncho-pneumonias, with their atypical temperature course and premature resolution, properly belong in this group? Also, the diagnosis of 11 cases of lobar pneumonia during one year with a mortality of zero may not unreasonably be questioned.

Bronchial occlusion due to exudate may occur in varying degrees, with absorption of the alveolar air of the corresponding areas, and according to its distribution give signs of lobar or lobular consolidation. Where the protective cough and free respiratory movement remain unimpaired, and this is mainly dependent upon the severity and site of operation, symptoms and signs of consolidation are transient and the outlook is favourable. If the bronchial obstruction be sufficiently prolonged, a more or less severe broncho-pneumonia will result, depending on the virulence of the organisms present. In bedridden patients where pulmonary activity is diminished due to pain, prolonged narcotization, and faulty posture an excellent medium for an infective agent is furnished. Infection may result from a previously existing bronchitis or from material aspirated at time of operation.

Following upper abdominal operations, in which the great majority of fatal pneumonias occur, the normal excursion of the diaphragm is inhibited. The increased abdominal tension resulting from this movement presses on and distends the recently traumatized tissues. The resultant pain prompts the patient to limit his thoracic movement to a minimum. Cough is almost completely suppressed. The distress and shock accompanying a persistent hiccough in these cases can be realized. Traumatism of the ribs acts even more directly towards limiting respiratory movements. Further proof of the etiology and nature of this condition is evidenced by the findings that fully 80 per cent of these so-called pneumonias are basal in character and that involvement of the right side predominates. This coincides with the conclusions of other investigators. Post-operative pneumonia is nearly three times as common in men as in women.

Seasonal variations were thought at first to be definite in character. The first three years showed a preponderance of complications during the winter and spring months. The last two years reversed this impression. It is certain however that periods of epidemic respiratory infection are less conducive to a normal convalescence.

When one comes to consider the part played by the anæsthetic in the production of these complications certain fallacies must be avoided. During the years 1929 and 1930, in a total of 11,672 operations, ether was used in only 42 per cent; 82 per cent of all the lung complications followed its use. The importance of the site of operation is shown in Table No. III.

TABLE III

1929 AND 1930.—OPERATIONS UNDER ETHER

	Upper abdominal	*Lower abdominal*	*Non-abdominal*
	509	1,174	3,331
Post-operative pul. complications	29	25	12
Percentage of p. o. pul. complications	5.7	2.1	0.36
Deaths	10	1	3

Lower abdominal operations in the above table include herniotomy. Nose and throat operations account for a large proportion classed as non-abdominal, which also includes radical amputation of the breast, excision of glands of the neck, nephrectomy and certain other major operations.

COMMENT

If these figures are accepted as representing the general experience, and recent reports from other sources are substantially in agreement, the relation between the type of operation and a normal convalescence can hardly be questioned.

Efforts to provide an efficient substitute for ether have produced the barbiturates and avertin. Reinforced by nitrous oxide and occasionally ether, it cannot be denied that in many cases they are most satisfactory. It is doubtful if their non-irritating properties wholly compensate for the protracted elimination period. The increasing use of spinal anæsthesia for operations below the diaphragm shows great promise for the future.

Efforts towards the improvement of anæsthetic methods are still possible. The most striking minor phenomenon of ether anæthesia in its early stages is a hypersecretion of saliva and mucus. As the coughing and swallowing reflexes are abolished these secretions tend to enter the respiratory channels and produce the dyspnœa and cyanosis often associated with ether anæsthesia. With short anæsthesia and with ordinary care no unfavourable results are likely to follow. The excessive secretions are quickly expelled by the normal protective mechanism of the lungs and the bronchial passages, remain open. If respiratory depression be present, a few minutes of Co_2 and O_2 administration will increase the respiratory volume several hundred per cent. Further administration in the wards is indicated when denarcotization is delayed. Suction of the mouth secretions should be performed when the need arises.

In operations on the upper abdomen the risk of these complications is doubled. It has long been the custom in this hospital to use the intratracheal method for administering ether to these cases. By this means direct contact between ether vapour and the salivary glands is avoided and dyspnœa and cyanosis reduced to a minimum. The anæsthesia is constant and uniform and the absence of respiratory effort makes for a "quiet" abdomen. This last feature is not an unmixed blessing, and thorough de-etherization is of the highest importance here. A second catheter, passed to approximately the same depth as the first, and attached at its free end to a small rubber bag, provides for partial rebreathing throughout the operation.

Distension of the stomach can be relieved by the passage of a tube, and gastric lavage with sterile water at the end of operation will reduce vomiting to a minimum. It is obvious that these procedures can be carried out best by the anæsthetist when free access to the mouth can be had without disturbing the level of anæsthesia. Continuous hypodermoclysis of Ringer's solution counteracts blood concentration from loss of body fluids. Posture during and after operation is of importance. It is significant that the departments of gynæcology and urology have been free from these post-operative complications for the past two years. The Trendelenburg position appears to favour bronchial drainage and the integrity of the upper abdominal musculature is not impaired.

Although the less irritating anæsthetics have contributed to these figures ether anæsthesia predominates over all the others combined. As long as ether remains one of our most valuable anæsthetic agents definite improvement must be looked for along other lines. It is evident that proper selection of the most suitable anæsthetic is dependent upon the previous history and the physical examination of each individual patient.

The importance of prophylaxis becomes more apparent in view of the lack of available treatment of these conditions, once they have developed. A history of sanatorium-residence, previous attacks of pneumonia, or even frequent colds, calls for the close cooperation of the surgeon and anæsthetist. Active upper respiratory tract infection constitutes a definite contraindication to operation whenever it can be postponed. Although the aspiration theory of pulmonary infection is generally opposed at the present day, pre-existing upper respiratory disease undoubtedly pre-disposes to post-operative pulmonary complications.

If operation is imperative in the presence of one of these conditions the use of ether is not permissible. Nitrous oxide is the anæsthetic

of choice. The lack of relaxation may be overcome by suitable pre-operative medication and by local infiltration. Several years ago a method of intratracheal nitrous oxide administration was devised in this hospital to meet the needs of those cases in which ether is contra-indicated. This has proved relatively satisfactory and no untoward effects have followed its use.

To strike a balance between the values of the different anæsthetic agents in surgery requires the consideration of many factors. The avoidance of a routine is perhaps the greatest sign of progress.

MENTAL TROUBLES OF THE FIFTH AND SIXTH DECADES

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THERE is no need to apologize for bringing this subject before the active physician. Any doctor whose practice is at all large has been much worried by the many types of "nervousness" which a fair percentage of his family clientèle will exhibit around this period in life. These nervous troubles are varied in character and degree, ranging all the way from simple restlessness, irritability, insomnia, slight depression, etc., to attacks of deep agitated melancholia so severe as to require months or years of institutional treatment. Even this does not tell the whole story, for any practitioner can at once recall many cases which in this age period have become hopelessly insane and spent the remainder of their lives in an asylum.

As in physical disease, mental illness within this age limit is much more devastating in its effects upon the family and community than is the disablement of people either younger or older. These patients usually have families dependent on them; they occupy an accepted niche in their community, and the responsibilities which they can no longer shoulder must be discharged by others, all this in addition to the care which the patient himself must receive.

Lack of space compels me to exclude all mention of mental upsets caused by the physical illnesses common to this period, *e.g.*, general paresis, toxic conditions, etc., and to confine myself to the abnormal mental phenomena for which as yet we can find no adequate physical basis. In other words I am considering only the so-called "psychogenic" cases.

Let it here be frankly confessed that we know little or nothing of the actual causes of these infirmities; much has been surmised, little that is definite is known, but this paper attempts to point out some of the causes which I believe to be operative at this period of life, and some of the dangerous character traits which I believe the family physician, with his intimate knowledge of the patient, should be able to recognize, often for years, before the actual breakdown. Brevity will force me to omit all mention of the way in which we may forecast the precise nature of the threatened illness, and I will for the same reason be able to only indicate what little we know of the management and treatment of such cases once they are allowed to become full-blown.

Let us first consider what effect the age of the patient may have in the development of these psychoses. At forty this mysterious force that we call *life* has about reached its climax. Up to that age most of us are conscious of reserves of force and energy; we still consider ourselves young; hope is still with us. No matter what misfortunes may come we feel that there is still time enough for something to happen, some change to occur, but when a woman wakes up on her forty-fifth birthday and finds her periods beginning to cease,* or a

* A great deal of loose thinking exists in regard to the menopause as a cause of mental trouble in women. It does not follow because a woman shows signs of emotional instability during the decade in which her menopause takes place that this cessation is necessarily the cause of her mental upset. No thought is given to the fact that while the menopause is constant, mental trouble at this period is by no means constant. The menopause is only *one* symptom of the great underlying fact that I have tried to indicate, *viz.*, that life is passing. The woman at 45 has reached the apex of her physical powers, her hair begins to turn, she feels herself that she is not as young as she was. Many a man blinds himself to this fact for years after the world knows he is old. To a woman, however, the menopause brings home the unwelcome truth that youth has passed in a way that brooks no concealment. So far as I am aware there is no proof that the physiological condition termed the menopause causes insanity *per se*. It, like greying hair, is only one among many symptoms of the ebbing stream of life. It is a further pertinent fact that men at fifty show mental conditions which cannot clinically be distinguished from these so-called menopausal psychoses of women.

man arrives at his fiftieth milestone and takes note, perhaps for the first time, of the grey in his hair, the realization can no longer be evaded that life is passing, that the rest of the way lies down hill, that many dreams and ambitions which youth cherished must now be laid aside. Except to those who have great natural or acquired philosophy this realization in itself constitutes a psychic stress of the first magnitude; add to this the fact that it is often at this period that our responsibilities and worries become the greatest, and then add to these the above-mentioned fact, that these stresses impinge on us precisely at the moment that our natural vitality and optimism is beginning to wane, and we will I think admit that it is precisely in this period that we should expect any defects which may have hitherto existed in our emotional control to become apparent.

Bearing these facts in mind, it becomes quite evident that every family doctor should regard these decades as critical periods in the lives of all those who regard him as the guardian of their health. Not only must he be able to detect the beginning symptoms of mental instability, but he should have some idea of what little is known as to the other predisposing factors which lead some persons to break down at this period while many survive its perils in comparative comfort.

As stated before, we know little or nothing of the actual causes, whether they be psychic or physiological, of insanity, but I would like to point out two or three factors which I at least have found to be fairly constant in these cases. In the first place these people are usually not versatile in their interests, but are generally rather one-sided. It may be that they devote all their attention to their work, and if that interest fails them they have nothing left. A woman may devote her whole thought and interest to her family, but when they grow up and leave home her life is empty indeed. The man who retires from business without first developing some hobby is always, to say the least, restless. I have seen acute depressions develop in men who, until they became elderly, found their whole interest in athletic sports and the social diversions incidental to these. As advancing age made these outlets unsatisfactory they were left with no means to escape themselves. Again, among women who even well on into middle age seemed to find their chief emotional satisfaction in their sex appeal to men, I have seen, once the inexorable years prevailed, the same conditions develop. Many men also allow their sexual life to dominate them. In these cases too when the years take their toll we should not be surprised if trouble develops. In other words these people lack the ability to grow old gracefully. They are unable to fill their lives with interests which time cannot touch, whether it be chess, the lodge room, writing for medical journals, gossip, or what you will. Some interest we must have if we are going to remain happy. Let me be clear here. I am not implying that happiness is necessary to sanity; we all know people who with every cause for unhappiness are still stable, but this leads me to what is the major defect to be found in all these people. The existence of this defect is at once the reason why it is so vitally necessary for such persons to have outside interests to make them happy and why absence of happiness is so often fatal to them. These people, as a class, pay altogether too much attention to themselves and their emotions. They have never learned to watch life as it flows by them, to take a detached yet lively interest in its manifold aspects, to get that calm, philosophical enjoyment from our contacts with the world which can only come to those who, rich or poor, educated or illiterate, fortunate or unfortunate, have learned the lesson that happiness can never be attained by an anxious striving after it and an anxious consultation of one's own feelings in every emergency of life. This tendency to pay undue attention to our own emotions has been mentioned by me before.[1] It is dangerous at any period of life, but more so as the critical age comes on, and if reinforced by some of the preceding factors no doctor should be surprised if unfortunate results ensue.

It is beyond the scope of this article to detail the precise type of mental trouble which may occur; that will be largely determined by the temperament[2] of the individual. Practically all the psychic ills to which younger people fall a prey are met with in the later years. They will range all the way from neurasthenia and depression (most common) to attacks of confused agitation, mania and, in too many cases, incurable insanities.

The whole point of my paper is this. No

doctor can ever afford to take lightly even mild symptoms occurring in a person over forty. The individual at this age who goes to him complaining of insomnia, restlessness, inability to concentrate, inability to think clearly, depression, peculiar sensations, vague ideas of persecution, etc., has just as much claim to his quick and active interest as if he complains of a pain under McBurney's point. I quite realize that this lack of interest which I am implying is not the fault of the doctor. Medicine and surgery have told us what to do for appendicitis. Psychiatry has so far told us very little as to what we should do for these people, but just because it is little is all the more reason for doing what we can, and it is often surprising how a little assistance will enable a patient to ward off an attack which otherwise might devastate the rest of his life.

In the first place, all organic causes should be excluded, and if any are present they should be corrected as far as possible. Few doctors are remiss in this. In fact, while heartily concurring in this procedure, I should like to utter a mild warning. Some men and many women have been made hopeless neurasthenics by the painstaking conscientiousness and anxious examinations of numerous doctors. People in the throes of a beginning mental breakdown are prone to change physicians; their very restlessness, as well as their desire to secure relief, drives them from one to another. Each physician carefully does his duty and each in turn finds the same minor ailment, for who does not possess one or two at fifty? By the time the tenth or eleventh practitioner is reached it is not surprising that the woman has her attention pretty well rivetted on the slightly enlarged uterus or the suspicion of an infected sinus, and small wonder if she is accustomed to numerous bottles of medicine. By all means, we must have adequate physical examinations, but we must never in dealing with these people forget the above aspect. In other words, unless it reveals clear evidence of an organic basis we must make the patient realize that the physical examination is an adjunct of our treatment, not the principal thing.

What then shall we do for management if the ordinary medical procedures have to be minimized? It is admitted that preventive medicine is the most potent weapon the profession has forged in its warfare against the ills which beleaguer humanity, and if there is one specialty in which preventive medicine is of more value than another it is in psychiatry, and yet I think I am making a moderate statement when I say that the bulk of our profession do not know as much about preventive medicine in the field of psychiatry as they do in, say, tuberculosis or typhoid.

The combination of characteristics, temperament, environment, occupation or lack of it, which I have indicated so sketchily, should, as far as we know them, have been recognized years before by the family physician and the proper warning and counsel given. It can be urged with reason that individuals will not receive with very good grace the information that unless they change certain ways of life and alter certain characteristics they are in danger of a mental breakdown. But we have taught the public to accept our counsels in other fields of medicine, and it should be possible in the field of mental health, provided we ourselves take pains to investigate this branch of the healing art with the same thoroughness that we bestow on the rest of the science.

But while the above ideas sound very nice and give me a virtuous glow while writing them, I am acutely aware from personal experience that the great question is "What can I do for this nervous individual who has come to me for help?" I propose to devote a concluding paragraph to the answer, but libraries have been written on the question and no better proof than this fact is needed to assure us that we are still a long way from any adequate or rational treatment of these conditions. I can only venture one generalization with any degree of certitude. It is this. There is no routine treatment for any of these patients; they all vary. Each individual with his symptoms, problems and environment must be studied in the light and by the aid of what experience and knowledge the doctor may have. One patient may benefit by absolute quiet, rest in bed, the care and attention of trained nurses; with another these measures may prove fatal, in that they will supply the precise conditions under which incurable flight from reality may take place.

In general we can say that, as in most other diseases, once symptoms have set in, the

treatment is palliative only. Keep up the physical condition, reassure the patient, introduce a correct regime of sleep, recreation, exercise and occupational therapy, use sedative baths when you have reason to believe they will be of value. Hypnosis and suggestion have their place in a few cases. Psycho-analysis in skilled hands, and with certain patients, is another weapon. Occasionally, dramatic measures such as the induction of a prolonged "twilight" condition (three days to two weeks), may cut short the vicious circle. These things are all of value and are available at any modern psychiatric clinic. But the fact remains that while we can do much for these patients after symptoms set in, it would be much easier, once the public were educated to accept our advice, to prevent the symptoms, and in this as in other fields of medicine we must depend on the mainstay of our profession—the family doctor.

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ULTRA-VIOLET RADIATION IN ITS GENERAL APPLICATION TO DISEASE*

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XII

THE history of ultra-violet treatment is extremely interesting. It is a matter of surprise when one discovers that exposure of the body to the sun's rays was a method of treatment commonly prescribed in ancient Greece and Rome. Owing to the fact that religion and medicine were at that time so intimately connected—the priest acting also as the physician—the advent of Christianity witnessed a reaction against all pagan practices, and sunlight treatment fell into disuse for many hundreds of years. Finsen, Bernhard and Rollier have been the real revivalists in the last decade of the nineteenth and the first of the twentieth century.

In recent times ultra-violet treatment has undergone certain vicissitudes. It is an axiom that every action provokes an equal and opposite reaction. Certain manufacturers of sunlight lamps began an unwise campaign for the popularization of their products. They were not content to deal solely with the medical profession, but also endeavoured to sell their wares to the lay public. Extravagant claims were made in the lay press, and as a consequence ultra-violet treatment became a craze, the charlatan saw an easy way of reaping a rich harvest from the unwary, and quackery became rampant. Then followed the publication of a report by the General Medical Council, inspired, no doubt, by the fear certain sections of the profession felt in regard to this flood of unqualified practice. The report itself, be it known, was the work of a single woman doctor, and though its findings were, later, categorically contradicted by so great an authority as Sir Leonard Hill, infinite damage to the progress of physical medicine was done. Inevitably, the pendulum begins to swing back a little once more. What then, is the true position in regard to the medical value of ultra-violet rays? This short paper will endeavour to give a brief survey.

ERYTHEMA AND PIGMENTATION

There are certain obvious, well-known effects which follow ultra-violet irradiation. The most definite of these—because they are visible to the naked eye—are erythema and pigmentation. A striking feature in regard to actinic erythema is that it only appears after a latent period of from 4 to 12 hours. This reaction may be followed in a few days by desquamation, if it has been sufficiently intense. Erythema is not necessarily followed by pigmentation, but this is usually the case, the amount varying with the type of patient and the source of radiation used. Different sources of ultra-violet rays produce different shades of bronzing. Sunlight produces a chocolate-brown coloration, the carbon arc a

* This paper is No. 12 in the series on Physiotherapy. For the preceding articles see the *Journal*, 1931, **24**: 263, 409, 539, 679, 831; and 1931, **25**: 65, 164, 311, 444, 582, and 702.

more reddish brown, the quartz mercury-vapour lamp a yellowish grey.

ACTION ON THE CIRCULATORY SYSTEM

The phenomena of erythema and pigmentation can naturally be made use of in the treatment of certain conditions.

In many of the rheumatic disorders it has been found that the skin temperature is habitually below normal, the skin is inactive, perspiration rarely occurs, and the response of the skin to sudden variations in temperature is extremely sluggish. These cases receive great benefit from general irradiation of the body, especially when a powerful carbon-arc lamp is used as the source of ultra-violet radiation. The physiological condition of the skin improves, the skin capillaries dilate, and hence there is an enhanced blood supply to the epidermal and dermal cells; the sweat and sebaceous glands become more active and, what is perhaps the most important fact of all, the skin becomes warmer and reacts more readily to changes of temperature, so that the patient loses that chilled feeling when his surrounding temperature is lowered.

It is a surprising fact that this dilatation of the skin capillaries may last for years. Some years ago certain tests were carried out on a patient's forearm with the quartz mercury-vapour lamp. Small circular areas were exposed for varying periods to the lamp and erythema produced. Two and a half years later, it was easy to locate these areas by placing the arm in hot water for a few minutes, the circular areas clearly standing out from the surrounding paler skin.

Ultra-violet treatment is often of value in the treatment of chilblains. Cases of alopecia areata can nearly always be cured by the production and maintenance of erythema on the affected areas. Another condition in which it is sometimes possible to obtain slight improvement by ultra-violet radiation is cirrhosis of the liver. In these cases long-standing dilatation of the superficial capillaries of the skin can be obtained and this lessens the amount of blood in the portal circulation.

The power of ultra-violet rays to produce a beneficial inflammation can be made use of in such conditions as indolent ulcers. In these cases it is possible to foster the shedding of dead tissues, and afterwards stimulate the growth of the surrounding cells. In the first process a sharp inflammatory reaction must be produced, and afterwards much milder irradiation is required, otherwise the newly formed cells will be destroyed. This regenerative effect of the ultra-violet rays is invaluable in the treatment of burns and scalds. The most satisfactory method is to spray the lesion with liquid paraffin and then gently remove as much damaged tissue as possible; afterwards the affected area should be irradiated with a quartz mercury-vapour lamp for two minutes at a distance of three feet. This procedure should be carried out daily until the burn is soundly healed. Gauze soaked in liquid paraffin is used to dress the burn after irradiation. The striking features of the treatment are the rapidity with which healing takes place, the excellent supple scars which are obtained in severe cases, and the painless character of the treatment.

BACTERICIDAL ACTION

Another action of the ultra-violet rays which is easy to demonstrate is their bactericidal effect. Exposure of cultures of various organisms such as the staphylococcus to ultra-violet rays from a quartz mercury-vapour lamp showed that the organisms can be killed in as short a time as 20 seconds. It is true that this effect is only a surface one, and that one organism may even shield another lying directly below it, so little power of penetration have the bactericidal ultra-violet rays. Nevertheless, this action is of great value in the treatment of such conditions as impetigo, furunculosis, erysipelas, etc. It may be said, and often is, that impetigo is one of the minor affections of the skin which always yields in a very short time to treatment by antiseptic ointments. This has not been our experience. We have often seen cases which did not yield to this treatment for months. They were, however, soon cured by ultra-violet irradiation. Originally it was thought that lupus was cured by a direct bactericidal action of the rays, but now it is generally agreed that this is not the case and that organisms are destroyed by the reaction which follows irradiation of the tissues. This reaction means that the local blood supply is greatly enhanced, and thus greatly increased numbers of blood corpuscles are available to combat the infecting organisms.

ANALGESIC EFFECT

In certain conditions the analgesic effect of the ultra-violet rays may be made use of. Such cases are:— prurigo, pruritus, neuritis, etc. In prurigo and pruritus relief is often obtained, but careful dosage is essential to obtain any benefit; otherwise the rays may even produce aggravation.

Ultra-violet radiation is also invaluable as a counter-irritant. It has been suggested that a mustard plaster is equally efficacious. A very valuable use of this counter-irritant effect is in cases of pain following the extraction of an impacted wisdom or other tooth. It is difficult to see how a mustard plaster could be used in cases of this nature. This counter-irritant action can be successfully used in sciatica, brachial neuritis, pleurodynia, lumbago, arthritis, etc.

Ultra-violet radiation can also be employed in the treatment of certain lesions of the spinal cord, such as disseminated sclerosis, locomotor ataxia, anterior poliomyelitis, etc. In these cases ultra-violet rays are applied locally to the skin over the spinous processes of the vertebræ. In this way a counter-irritant effect is produced by the constant erythema which is maintained over the treated area.

Many cases of asthma can be relieved by the production of a strong erythema on the front and back of the chest.

GENERAL IRRADIATION

Ultra-violet rays, however, are most frequently and successfully used for the irradiation of the whole body. It is true that ultra-violet irradiation has a beneficial psychological effect on patients; so also has natural sunshine, and this effect is of benefit in many conditions where the hopeful outlook of the patient is of great importance. The creation of this confidence is often invaluable, and turns the scale between success and failure. There are other effects following general irradiation which are equally important. These are:— the production of vitamin D in the body; the action of ultra-violet rays on the blood; the action of ultra-violet rays on the sympathetic nervous system.

VITAMIN D

It has now been proved that vitamin D plays a very important part in calcium and phosphorus metabolism. There is a fat present in the epidermis called ergosterol and when the body is irradiated with ultra-violet rays for a suitable length of time, this fat is converted into vitamin D. This reaction is a photo-chemical one, and may be responsible for the characteristic smell, similar to that of burning horn, which is so often produced on the skin during irradiation. The production of vitamin D in the body by this means has been found to cure rickets. Quite small doses of ultra-violet radiation are sufficient. It is customary to give two months' treatment on alternate days to children under the age of one year, and for older children as many months' treatment as the child's age in years, with the addition of an extra month. Bony deformity, even when it is marked, will often disappear with the treatment; this, of course, occurs most frequently with young children. The allied conditions of tetany, spasmophilia and laryngismus stridulus also respond successfully to irradiation. Röntgen photographs taken before and during treatment reveal the rapid disappearance of the abnormal bone conditions.

Ultra-violet radiation has proved of great value in other bone conditions, such as delayed union of fractures, chronic osteomyelitis, osteomalacia and osteitis deformans. In these cases the increased retention of calcium and phosphorus is probably the important factor. Ultra-violet irradiation is invaluable in pregnancy and during lactation when there are such great demands made on the calcium reserves of the mother.

Cases of acidosis improve after irradiation and this is probably also due to the increased retention of calcium and phosphorus salts which are basic in reaction, and which, therefore, tend to correct the reaction of the body fluids.

ACTION ON THE BLOOD

Finsen proved that ultra-violet radiation increases the number of red blood corpuscles and also the amount of hæmoglobin present in them; it also causes certain changes to take place in regard to the white blood corpuscles—the eosinophiles and lymphocytes are increased and the polymorphonuclear cells are decreased. Irradiation is, therefore, of value in secondary anæmia after hæmorrhage or prolonged illness. Irradiation also raises the bactericidal powers of the blood and this possibly is one reason why it cures the majority of cases of surgical tuber-

culosis. Cases of bone and joint tuberculosis, tuberculous lesions of the skin, peritoneum, glands and genito-urinary system all respond favourably to ultra-violet irradiation. Patience is naturally necessary in severe lesions of the hip and spine, but the results are excellent, especially in early cases. The outstanding feature is the wide range of movement which is present in satisfactory cases.

ACTION ON THE SYMPATHETIC SYSTEM

The depressor action of ultra-violet rays on the sympathetic nervous system is extremely interesting. It has been found that irradiation decreases the amount of blood sugar in cases of hyperglycæmia, and also lowers the blood pressure in cases of hyperpiesia. At first the fall in blood pressure which follows irradiation was thought to be due to a dilatation of the superficial blood vessels, but it is now known that this fall occurs immediately after irradiation, that is before erythema has developed. The cases of hyperpiesia which respond most satisfactorily to irradiation are, naturally, those in which the condition is not associated with arteriosclerotic changes or chronic kidney disease.

The action of ultra-violet rays on the male and female sexual glands is of great interest. It has been recorded that many old-standing cases of sterility have yielded to irradiation. Irradiation is also of great value in treatment at the menopause.

TONIC EFFECT

Ultra-violet irradiation has been proved to have a stimulating tonic effect in a large number of conditions, particularly in cases of post-influenzal debility; also after prolonged fever or suppuration, and after operations.

General irradiation has also been found to be of great value in the treatment of a number of chronic inflammatory lesions of the eyes, such as kerato-conjunctivitis and irido-cyclitis; also in certain diseases of the throat, nose and ear, such as tuberculous laryngitis, hay fever, ozæna, etc., where it is advantageous to combine local and general irradiation.

This paper attempts to give only a brief outline of some of the medical uses of ultra-violet rays, but it is hoped it may have convinced the reader that ultra-violet radiation is an important addition to our present day methods of treating disease.

NOTES ON A SMALL EPIDEMIC OF INFANTILE PARALYSIS OCCURRING IN A COUNTRY PRACTICE

BY C. B. CAMERON, M.D.,

Petite Riviere, N.S.

IN the following pages an attempt is made to visualize the pre-paralytic symptoms in 17 cases of infantile paralysis which came under my notice at Petite Riviere and the adjacent district during 1930, and 1 case that occurred in 1928. The clinical notes of the cases are also given in brief.

The stage of invasion lasted four or five days and varied greatly. The symptoms complained of were largely those usually found at the onset of any infectious disease with some localization of the infection in the central nervous system. Their severity varied with the amount of fatigue previously present, exposure to the weather, or the virulence of the infection with which the patients had been in contact. The chief early symptoms were mild—slight chills, frontal headache, pain in the limbs and fever—decreasing after the second day; then occipital headache with tenderness of the limbs and spine. Irritability and restlessness were common features. Vomiting of clear fluid occurred twice, in each case associated with constipation. Retraction of the head was seen for a variable time before paralysis set in in 4 cases. Stiffness of the neck, gradually increasing in intensity, was observed; it was not always perceptible at first and often had to be searched for. This was done by bending the head on the neck and then the neck on the chest, when either the neck was recognized as stiff or there was a drawing pain in the back and loins. The Kernig and Babinski signs were not usually positive in this series.

Naturally, at the beginning of the epidemic, when so many of the cases were mild, there was ample opportunity for contact and the spread of the infection.

All but one of the cases occurred between July 31 and October 3, 1930, and fifteen of them in September of that year.

The case reports are submitted in brief herewith.

CASE 1

A boy, aged 8, was seized with convulsions of moderate severity lasting half an hour. When seen he was flushed, with a temperature of 103° F. He had no marked distress, but complained of pain in the right ear. The neck was not stiff and there was no Kernig's sign. He felt good for nothing for four days. After that it was noticed that his mouth was twisted when he laughed. The ear had to be incised and pus was evacuated. The diagnosis of poliomyelitis in this case is doubtful.

CASES 2 AND 3

Two brothers, aged 3 and 8 years, respectively, belonging to the village, became ill at the same time. The younger vomited a few times, had chills for two days, and was constipated. His limbs were tender on handling. He felt weak and tired. No paralysis was observed.

The older boy had anorexia, fever, chills, but no headache. He vomited during the first two days of his illness and then seemed better. On the fourth day it was noticed that his legs were stiff on going upstairs. When I saw the child on the fifth day his neck was stiff, and he had pains in his muscles and joints, especially in the right hip and lumbar muscles. On walking, his right leg was flaccid and the toes dragged. The anterior tibial group of muscles was paralyzed. He gradually improved and made a perfect recovery.

CASES 4 AND 5

A married woman, aged 28, living in the village, was seized with chills, fever, and pains in the head and limbs. At the end of three days she was apparently well.

The niece of the last, aged 34, and living in the same house, took ill with chills, fever, and pains all over the body; the onset resembled influenza. She did not remember having had pain or stiffness in the neck or lumbar region. I saw her on the fourth day. She had awakened with paralysis of the right arm and leg. There was very decided toe-drop. She felt very exhausted for a long time. I kept her with her arm extended and her foot propped up for a month, and then sent her to the Victoria General Hospital, Halifax, where she improved greatly.

CASE 6

A male, aged 19, who began with frontal headache, but he was able to go to church and store. After two days the pain had shifted to the back of his head. Then severe lumbar pains set in, which did not improve on his going to bed. On the fourth day there developed headache, pain in the back, and pain in the bladder (caused by retention of urine). The legs, arms, and rectum became paralyzed. I was then called to the case, and had Drs. Byrne and McKenzie in consultation. The patient was practically moribund at that time. The spinal fluid was not under pressure, but was opalescent and manifested a decided leucocytosis. Death occurred from respiratory paralysis on the fifth day.

CASE 7

A boy, aged 19, complained of pains all over the body. He vomited clear fluid once on the first day of his illness. He had a headache, which gradually shifted to the back of the neck. He was watched for two days. His face became grey and sweaty, and the head was retracted; temperature, 103°; pulse, 90; respirations, 26. The spinal fluid was under pressure and had a ground glass appearance. He was given 25 c.c. of convalescent serum. The next day the pain and stiffness were all gone, and no symptoms remained. However, he felt washed-out for a week.

CASES 8 AND 9

A girl, aged 18, felt squeamish the first day, and had chills, but no headache. The tonsils were enlarged, reddened—apparently a frank tonsillitis. After the bowels moved she felt all right. No further illness.

A boy, aged 19, the brother of the last, complained of pain all over the body and was feverish. The tonsils were smooth, reddened, much enlarged, and presented discrete white spots. No distress was elicited on bending the head down to the knees. There was frontal headache on the first day, shifting to the upper sternomastoid regions on the third day; on the fifth day there was pain in the back. When lying down the boy could not get up without help. There was a drawing pain in the spine, and the legs and arms were tender. On attempting to walk he could not raise his legs high and tripped over everything. I did not see him after the third day, as he lived five miles east of me, and I had concluded that the case was one of tonsillitis. However, I saw him six weeks afterwards, when the above condition was noted.

CASE 10

A boy, aged 19, came home sick at his stomach. He vomited clear fluid once or twice and complained of headache across the forehead. He did not feel right for two days; his limbs felt as if he were getting a cold, being painful and tender. There was no sore throat. The back of the neck then became stiff, and the head was retracting. Two days later the spinal fluid was under pressure and opalescent; serum was given. The next day the neck was limber, and the sweating ceased. The boy was very pale and his back was still painful on walking.

CASE 11

A seaman. While at sea he was taken with severe vomiting, headache and pain in the back. He went to his bunk at the end of the second day, and his distress ceased. On the fourth day he had deltoid paralysis. When I saw him the following signs were present,—greyness of the face, sweating, some retraction of the head, and a flaccid paralysis of the right arm. The bowels had not moved for six days. After spinal puncture and the exhibition of urotropine and purgatives his condition improved, but he died in the Victoria General Hospital, Halifax, of pneumonia two months later.

CASE 12

A female child, aged 3 years, taken with drowsiness, frontal headache, and chills; she vomited once clear fluid. Pain was not a feature. The face was white and moist, signs which were discounted as the child had always looked rickety. The head was somewhat retracted; Kernig's sign was not present, and there was no distress on curving the neck forward on the shoulders (Alcock and Luther's sign). Later, I was told that her neck was stiff, but this was hard to substantiate as the child was very irritable. On the fifth day the deltoid and anterior tibial groups of muscles were paralyzed. I gave her serum and immobilized her, and later sent her to the Children's Hospital, Halifax, where she improved greatly.

CASE 13

A child, 3 years old. On the first day "stuffiness" of the head and fever. On the second day the child ate an ordinary breakfast, but by four o'clock was

more feverish and disinclined to talk, and lay down. No stiffness of the neck was noted at this time. At 7.30 p.m. the neck became stiff; there was distress when the head was moved forward; pain in the back, and the spine and neck were very tender. I gave 20 c.c. of Rosenow's serum. On the third day at 9 a.m. the symptoms had disappeared. At 4 p.m. the fever returned. At 7.30 p.m. the pain in the head was severe and there was some retraction. The child was moaning and exhibited aimless rhythmical movements of the arms: temperature 104°; pulse 120; respirations 40. There was distress on curving the neck forward. I gave 45 c.c. of convalescent serum, with chloral and bromide, and the child passed a moderately restless night. On the fourth day at 7 o'clock the child was clearly *in extremis*. Caffein sodium benzoate was given. Death occurred from cardiac failure at 10 o'clock.

A consultant who arrived after the child's death thought that this might possibly have been a case of cerebrospinal fever. I think that a spinal puncture should have been done here and that I did not give enough serum early.

CASES 14, 15 AND 16

These were small children, seen on the first to third day of illness. They had a temperature of 102° with headache and some stiffness of the neck. They were given serum. The next day they were all well. At the time they seemed much prostrated. As no puncture was done the diagnosis is only a probability.

CASE 17

A girl, aged 12, who had not felt right for a week. Her illness began with shivers. At the end of the second day she had a dull headache over the frontal region, gradually moving backward. The limbs were tender. On the third day the right arm and the left leg were paralyzed. Three months afterwards she could walk, but there was slight deltoid paralysis.

The next case reported belongs to 1928 and is much more typical. The symptoms were those usually observed when no epidemic was in progress. The case is seen after the damage is done.

CASE 18

A girl, aged 14, came home from school on account of a severe steady frontal headache. She had slight chills and felt as if she was developing a cold. On the third day the limbs were tender and the headache had shifted to the back of the head. On the fifth day she felt fairly well, but had backache and a sore neck. She started to walk across the room and her leg gave way from under. She had paralysis of the anterior tibial muscles, which gradually improved. I then saw case for the first time.

COMMENTS

On consideration of these cases it will be seen that in 8 of the number recovery took place without the development of paralysis. Cases 2 and 4 might, under ordinary conditions, have been diagnosed as influenza or some similar condition, but in the light of the fact that in each case a related person in the same house developed typical poliomyelitis it is almost certain that we were dealing here with a larval type of the disease (so-called *forme fruste*). The argument would, of course, be stronger if spinal punctures had been done. Case 8 is also open to question, since, clinically, it was a case of acute tonsillitis. Yet the case of the brother of this patient, (No. 9) who also began with acute tonsillitis and ended with poliomyelitis and paralysis, is strongly suggestive that Case 8 was of the same character.

Case 1 is doubtful. Occurring in the course of an epidemic of infantile paralysis it might have been of the same nature, yet the paralysis of the face might be explained as the result of otitis media involving the seventh nerve.

In Cases 10, 13, 14, 15, and 16 the only sign of muscular involvement was stiffness of the neck. In Case 10 the diagnosis was made more certain by the fact that the spinal fluid was opalescent and under pressure. An interesting point in connection with Case 13 is that the little boy's kitten became paralyzed the day he died, but was unfortunately destroyed without examination.

It is clear from all this that the onset of infantile paralysis varies greatly in intensity, from cases in which there is little illness to those of fulminating type. In the small epidemic here recorded the severe cases occurred in persons who had become overtired or unduly exposed to the weather, or who had been in contact with seven cases. In three instances (Cases 2 and 3, 4 and 5, 8 and 9) two persons in the same house were affected at the same time, pointing to a common source of infection.

Other points of interest relative to the epidemic were that that district which had had cases of poliomyelitis previously (in 1928) escaped without any infection. Six months after the epidemic ceased we had one case of encephalitis lethargica.

In conclusion, I wish to make the following suggestions, based on my experience.

In testing for stiffness of the muscles, bend the head gently forward on the neck, while distracting the patient's attention as much as possible; this can usually be accomplished even a few hours before paralysis sets in. Do not be content with this, but bend the neck forward on the shoulders, when resistance will be encountered and the patient will complain of pain. More constant and characteristic is stiffness of the spine. This is best brought out by having the patient sit up in bed, and then

trying to bend the head down to the knees.

Do not try to treat these cases without the aid of a laboratory. A spinal puncture should be done in all suspicious cases, and, indeed, is a useful adjunct of treatment. The spinal fluid in cases of poliomyelitis is under moderate pressure and of ground glass appearance; the cell count is between 50 and 250.

Case Reports

TERATOMA OF THE THYMUS GLAND*

REPORT OF A CASE

BY R. R. STRUTHERS, M.D.,

Montreal

True tumours of the thymus gland are very rare and the available literature does not record an instance in an infant as young as the case reported herewith. Malignant tumours are quite rare, though neoplasms of the thymus have been repeatedly observed in myasthenia gravis.[1] Congenital cysts may arise in the anterior mediastinum from tracheal diverticulæ or congenital displacement of the bronchial tree, or the entodermal epithelium in the thymus may also be a point of origin. This probably is the etiology of some dermoid cysts, usually lobulated multilocular tumours with yellow-white fatty contents, or they may arise from inclusion of epidermis during the closing of the thorax. Cystic teratomas appear similarly but contain cartilage, bone, mucosa or tissue from all three germinal layers. Tumours of the thymus are clinically called mediastinal tumours, which may include tumours of the bronchial and mediastinal lymph nodes. All these tumours become dangerous from pressure and invasion of other surroundings. The case to be reported exemplifies these points.

Baby "W.M." was admitted to the Pædiatric Service of the Montreal General Hospital, May 12, 1931, at the age of five months, for choking spells accompanied by attacks of blueness and stiffness on crying. The family history was irrelevant, the birth history normal; the infant was artificially fed after the age of two weeks.

The history of the present illness is that the child was well until two months of age, when, while out in his carriage, he was found choking and blue by his mother. The attack lasted some ten minutes. No physician was called. There were no further attacks for a period of six weeks, when he again became blue, stiff and choking, followed after some ten minutes by limpness and apparent unconsciousness. Some two weeks later a similar attack occurred, which was repeated in about three hours. A physician was consulted who suggested that the thymus gland might be at fault, but did not refer the child for x-ray. Further attacks occurred during the next week. On May 5th he was brought to the outdoor department of the General Hospital when an x-ray was taken (Fig. 1). He did not return until the day before admission, when there was a series of attacks of

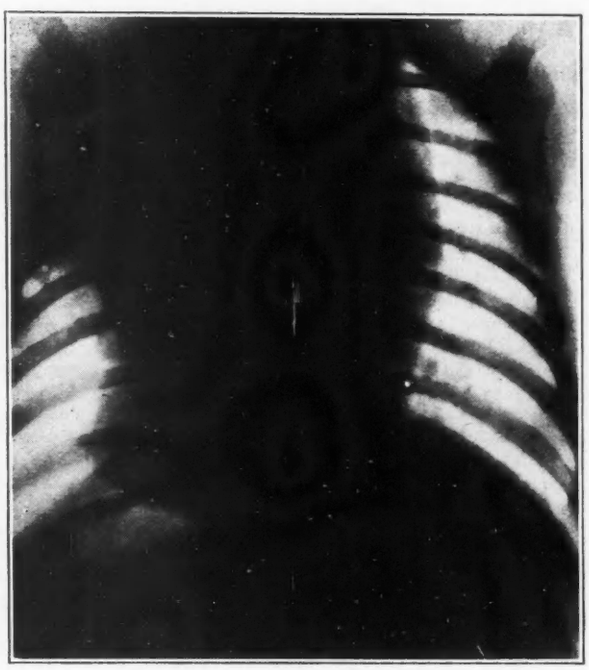

FIG. 1.—X-ray photograph of chest.

* Read at the annual meeting of the Canadian Society for the Study of Diseases of Children, Lucerne-in-Quebec, June 5 and 6, 1931.

cyanosis and limpness, for which he was admitted to the hospital.

On admission to the hospital on May 12th the child had extreme respiratory distress and constant cyanosis, unrelieved by posturing, a rapid uncountable pulse with fluttering heart sounds, and abdominal distension. There was no evidence of infection, but extreme distress. Examination on May 5th had shown that there was marked widening of the supramediastinal dullness over into the left axilla, with absent breath sounds over the left upper lobe, and the examination now showed the same condition. Blood count, urinalysis, Wassermann test, and the chemical examination of the blood were all normal. Fluoroscopic examination of the chest showed a large dense shadow occupying the whole of the left upper lobe. It did not pulsate or alter with inspiration and expiration. The heart was displaced downwards to the left. In the oblique view this dense shadow was seen to have a definitely rounded and circumscribed edge; the posterior mediastinum was obliterated; the trachea was not seen. The roentgenologist suggested that the shadow was not within the lung but was possibly due to an enlarged gland of Hodgkin's disease or

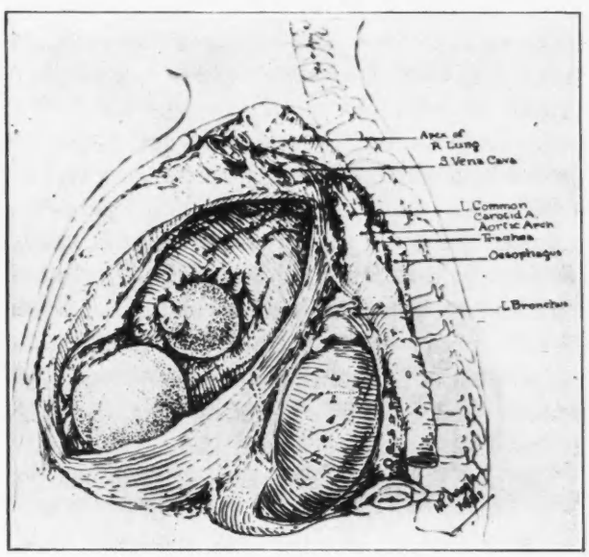

FIG. 2.—Schematic drawing of thoracic organs—left lung has been removed.

a mediastinal tumour. The child died twelve hours after admission in extreme respiratory distress. The usual attempts to prolong life were unavailing.

Autopsy was performed two hours post-mortem. Interest centred in the mediastinal tumour. In the anterior mediastinum covering the heart was a cystic tumour the size of a large orange. The wall was slightly roughened but not attached to the lungs or heart. Its superior and posterior upper part was attached around the arch of the aorta and the great vessels of the neck.

The following is the description of the tumour from the pathological department. "Viewed from above the trachea and œsophagus are seen to occupy their normal relations to each other, being compressed at the level of the tracheal bifurcation and retaining their normal diameters only in the proximal portions at the upper pole of the cystic mass. Immediately anterior to them are seen the three great arteries of the neck, widely separated and much flattened out and lying directly in contact with the tumour. The superior vena cava is stretched across the surface of the tumour, its bifurcation presenting at the most superior aspect. Directly to the right projects what is thought to be a large bifurcated artery, its larger branch 1.2 cm. in diameter, the smaller 0.3, the walls having the appearance of a blood vessel. A probe passes for a distance of 0.6 cm. in various directions through the larger lumen through numerous small blind sacculations; the smaller duct admits a small probe only to a depth of 0.3 cm. The tumour is intimately attached to the pericardium, which is continuous with it. Laid open, the pericardium is found to contain a normal amount of clear straw coloured fluid. The heart is normal in size, greatly flattened in its antero-posterior diameter, measuring 6 cm. in its transverse diameter. The maximum displacement is at the point of origin of the great vessels, which are normal in their relationship, but much flattened. The right auricle is dilated, bulging anteriorly into the right pleural cavity; the left auricle is small and atrophic, being overlain by the flattened pulmonary artery. The anterior surface of the tumour is partially covered by the free borders of the lungs, the upper lobe of the left forming a long tongue-like projection which extends to the level of the apex of the heart. The lungs are not adherent at any point to the tumour, their interlobar fissures are free and there are no adhesions. On inspection from below, it is seen that the bases of both lungs have been flattened out by the pressure of the tumour. The tumour fluctu-

ates, giving the impression of a thick wall with nodular, almost cartilaginous areas. Opening it, it is found to be filled with a thick yellow fluid containing flakes of cheesy yellow material giving the appearance almost of pus. It might be noted here that, microscopically, it contains only an occasional polymorphonuclear cell. The wall varies in thickness from 0.2 to 0.4 cm. and is lined by a continuous yellowish white glistening surface, to which is adherent a sebaceous material, easily scraped away. There are several firm pedunculated projections, the largest 3 cm. in diameter, almost spherical in shape, covered by what closely resembles skin and on the surface of which may be seen a growth of very fine short hair. This is firm on palpation, giving the feel of a hard rubber ball; about its base are several small cartilaginous projections, all of which arise from a white base. A small spherical projection, 2 cm. in diameter, arises nearby, from one side of which projects a tough, horny growth resembling a tooth. There is a third area in the form of a flat placque, with a tooth-like excrescence which is also covered by the same skin-like texture.

FIG. 3.—Remains of thymic duct.

"Microscopically the persisting thymic duct shows a tortuous arrangement, about which are islands of thymus gland. In many places these islands occur just beneath the epithelial lining of the duct. In places this arrangement is so striking that it gives one the impression of tonsillar crypts. The lining of the duct is mostly absent, but when it is present it is of the tall columnar type and in places flattened and stratified. There is some degeneration and desquamation. There is evidence of low grade inflammation of non-specific character, which has led to thickening of the wall of the duct and adherence of organizing tissue.

"The wall of the large cyst is lined with squamous epithelium similar to that found on normal skin surfaces. There are numerous well developed hairs associated with which are large sebaceous glands. There are also numerous well developed sweat glands. This well formed skin tissue rests upon a layer of fat. There are a few small areas of thymus tissue in the wall of the cyst. In other sections of the wall thymic tissue is abundant.

"A transverse section through the central portion and pedicle of one of the pedunculated round masses which project into the large cyst shows the following. The surface of the specimen, with the exception of that of the pedicle, is smooth and lined with squamous epithelium beneath which are hair-follicles, sweat and sebaceous glands, similar in every way to the lining of the cyst already described. The surface of the pedicle and the numerous crypts which open upon it are lined for the most part with tall ciliated columnar epithelium, yet there are here and there small areas where squamous epithelium is interspersed. The pedicle contains several different types of tissues and parts of organs which are for the most part well differentiated. There are isolated islands of cartilage, partially to almost completely differentiated bronchi, fat, thymus with Hassall's corpuscles, salivary glands, pancreatic tissue with islands of Langerhans, collections of dilated lymph vessels, smooth muscle and mucus secreting glands. No nervous tissue has been identified.

The above findings are those of teratoma."

SUMMARY

A case of dermoid tumour of the thymus is reported in a child of five months. He died with symptoms of obstruction of the air passages. One wonders if surgical intervention might not have saved this child's life had he come under observation earlier and the possibility of the diagnosis being considered.

REFERENCE

1. Kaufman's Pathology, Blakiston, Phila., 1929, 1: 503.

PRIMARY LYMPHOSARCOMA OF THE RECTUM*

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Montreal

R.C., a janitor, aged 55 years, was admitted to the Montreal General Hospital in 1916 with typhoid fever and in 1928 for a tonsillectomy. He was readmitted on January 13th, 1931, complaining of "constipation, passage of blood in the stools, excessive flatus and loss of appetite and weight." He had been constipated for many years. On December 6th, 1930, five weeks before admission to hospital, he noticed for the first time a trace of blood in his stool. Thereafter, blood had frequently been present. Four weeks before admission a dull pain developed about the lower part of the sacral and coccygeal regions. This was continuous, soon became associated with a continuous desire to go to stool, and was aggravated by bowel movement. The pain gradually became so severe that the patient could not sit down in comfort. An attempt to empty the bowels generally resulted in the passage of flatus only. For some time there had been a feeling as if there was something continuously in the rectum. He had no desire for food and had lost some weight. He had not felt fit for work for some time and his friends remarked his changed condition.

A thorough physical examination revealed the following. There was no visible abnormality about the anus or perianal region. The anal sphincter was firmly contracted and of good tone. Within one inch of the anal orifice a large mass was palpable on the posterior wall of the rectum. This mass extended upwards beyond reach of the finger, greatly narrowed the lumen of the rectum, was nodular and firmly fixed to the deep tissues, yet the mucous membrane moved freely over it. The anterior wall of the rectum was not involved. A proctoscopic examination corroborated the finding on digital palpation. The inguinal and superior cervical lymph nodes were palpable, but showed no evidence of tumour. The abdomen was rounded, symmetrical, moved normally and well on respiration, and was tympanitic. The liver, spleen and kidneys were not palpable. The reflexes were normal. The blood Wassermann test was negative. The urine was negative. An x-ray after a barium enema showed no definite evidence of new growth above the rectum. A clinical diagnosis of malignant tumour of the rectum was made and a colostomy was performed on January 22nd, 1931. On February 8th, 1931, up to which time the patient had had a normal convalescence, he suddenly became pale, the pulse was very rapid (150 to the minute), lips were cyanosed and he verged on unconsciousness. His face was asymmetrical, his right pupil smaller than the left, his right arm and leg showed paresis, and a plantar extension of the right great toe could be elicited. A diagnosis of cerebral embolism was made. All the above signs had practically disappeared within seven hours and the diagnosis of cerebral embolus was therefore changed to that of arterial spasm.

On February 19th, 1931, a Lockhart-Mummery perineal resection of the rectum was performed under spinal anæsthesia by Dr. A. Stewart and seven 2 mg. radium needles inserted in the presacral region. He received 2,352 mg. radium hours. Convalescence was slow. On March 14th he was given an indirect transfusion of 500 c.c. of citrated blood. He was discharged from the hospital on March 27th, 1931 when his general condition was much improved and the operation wound had practically healed.

Pathological Report M.G.H. S-31-252.—"The specimen consists of the anus and rectum, measuring 18 cm. long. After opening the specimen, a circular, soft mass, measuring 12 by 12 cm. and 4 cm. deep is exposed. It is soft, smooth, except in its centre where it is ulcerated, and could easily be broken through with the finger. The edges are heaped up and nodular. It is, on section, the colour of hardened brain tissue and of the same consistency. There are fine bands of connective tissue dividing it into coarse lobules. The whole bowel wall, excepting a small strip in its anterior portion, is replaced by tumour which is covered by a thin layer of mucosa, except in its very centre where the mucosa is ulcerated. The deep serosa has disappeared and the tumour spreads out into the surrounding fat. Anatomical diagnosis—sarcoma of the rectum."

For histological study, large, thin sections were taken from various blocks of tissue and stained with differential stains. A section through the upper margin of the tumour, including an uninvolved portion of the rectum, shows the following. Beyond the tumour the rectum is normal,

* From the Department of Pathology, the Montreal General Hospital, Montreal.

except for engorgement of the submucosal vessels. As the tumour is approached the vascular engorgement becomes more marked, the mucosa is hypertrophied, and the mucous glands and their lining cells contain an abundance of mucus.

At the margin of the newgrowth, the tumour cells begin rather abruptly, soon involve the whole bowel wall, and extend into the surrounding fatty tissue. The mucosa is greatly elevated by the enormous infiltration of the submucosa with tumour. The muscularis retains its normal position, but is diffusely infiltrated with tumour cells, and in the centre of the growth appears as thin muscular strands widely separated by masses of tumour cells. External to the muscularis, the fixed tissues are largely replaced by tumour tissue which is continuous into the perirectal fat. Still farther out, isolated collections of tumour cells are seen in the perivascular lymphatics and the fat surrounding them. At its margin, the tumour extends for a short distance into the submucosa and still farther beneath the serosa. For the most part, the tumour is composed of closely packed cells with scant stroma, containing thin walled blood vessels, but in some sections the stroma is more abundant, composed of wide bands of collagen in which numerous cells, phagocytic to old blood, are scattered about. Delicate capillary vessels are seen in the dense mass of tumour cells. Pre-formed vessels are present. Some of the sections show areas of necrosis of the tumour. Over the central portion of the tumour the mucous membrane is completely replaced by tumour cells, resulting in ulceration. The tumour cells are, for the most part, round, with very scant, pale staining cytoplasm, and most of them are about the size of small lymphocytes. Some of the nuclei are very dense, stain very deeply, and are compact; the majority, however, are vesicular and contain an abundance of chromatin which stains rather deeply. The nuclear membrane is distinct; no definite nucleoli are seen. Mitotic figures, though scarce, are present. With Laidlaw's reticulum stain the tumour shows a rather diffuse fine reticulum which divides it into small ill-defined lobules. Within these lobules there are packed silver-positive tumour cells, but no intercellular tissue is seen. Microscopical diagnosis—primary lymphosarcoma of the rectum.

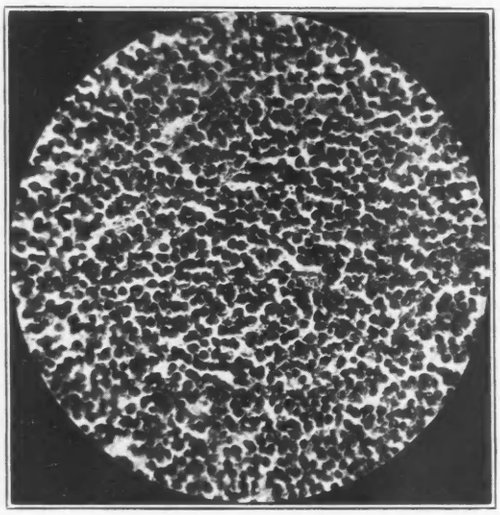

FIG. 1.—Photomicrograph to show type of tumour cell.

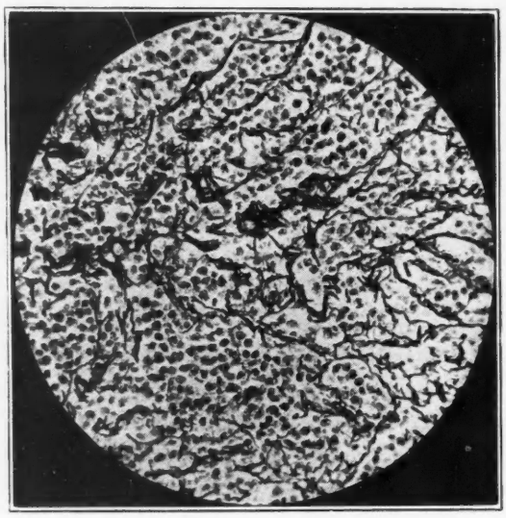

FIG. 2.—Photomicrograph of tumour stained with Laidlaw's reticulum stain, to show reticulum surrounding islands of silver-positive tumour cells.

DISCUSSION

Lymphosarcoma, though not an uncommon disease in general, is rarely primary in the rectum. In 1927, J. H. Weeks[1] reviewed 100 reported cases. Guret, in reporting 840 cases of sarcoma, found only 3 of the rectum. Nothnagel, in an analysis of 274 cases of lymphosarcoma operated upon in Vienna, found but 3 in the intestinal tract and only 1 in the rectum. Key, in 206 cases of malignant tumours of the rectum, found 1 sarcoma. There were, in the Department of Pathology of the Montreal General Hospital, over a period of ten years, 58 surgical specimens of carcinomata of the rectum and but 1 of lymphosarcoma, the case reported above. In 6,548 consecutive autopsies at the Montreal General Hospital, there were 252 malignant growths of the gastro-intestinal tract; 248 of these were carcinoma, and 4 were sarcoma. Of the carci-

nomata 36 were in the œsophagus, 117 were in the stomach, 3 in the small bowel, 50 in the colon, and 42 in the rectum. The sarcomata were distributed as follows:—small bowel 1, jejunum 1, ileum 1 and stomach 1. There were none in the rectum.

Sarcoma of the rectum is twice as common in males as in females. It has occurred as early as 11 and as late as 81 years. The average age is 45 years.

While the differentiation between sarcoma of the rectum and other tumours in this region may be very difficult; certain points should be borne in mind. Sarcoma of the rectum is usually low down and develops rapidly and, though large, the mucous membrane may move over it, as in our case. Carcinoma, on the other hand, tends to become fixed and ulcerate early. Cachexia is, as a rule, more marked in carcinoma. The tendency of sarcoma is to become voluminous and block the lumen of the bowel; also, its position is low; these features appear early in the disease and make defaecation difficult. This is particularly well illustrated in our case. Since sarcoma does not invade the mucosa as early as carcinoma, pain comes on later and, for the same reason, ulceration is somewhat late, hence bleeding is a late symptom. Lymphosarcomata may be polypoid, but their firm texture and smooth surface differentiate them from the irregular, soft and often cystic, mucoid, adenomatous polyps. The diffuse infiltrating form may suggest luetic stricture.

Where possible, local removal is advisable. Many lymphosarcomatous growths will respond to radium or x-ray. The prognosis, at best, is unfavourable. One patient has been reported to have lived for four years. The average is eleven and one-half months.

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A CASE OF PRIMARY CARCINOMA OF THE FALLOPIAN TUBE*

BY P. J. KEARNS, M.Sc., M.D.

Montreal

Primary carcinoma of the Fallopian tube is a comparative rarity in our clinic. During the past five years we have found records of one primary and two metastatic carcinomata of the tube.

The following is a report of the case of priary carcinoma of the tube which occurred here.

The patient was first admitted to the Royal Victoria Maternity Hospital in November, 1918. She was then fifty years of age and had symptoms of a sacro-pubic hernia, which was repaired. On October 4, 1925, she was again admitted complaining of daily vaginal bleeding during the preceding six months. Menopause had occurred nine years previously. No pelvic mass was palpable and a pre-operative diagnosis of fundal carcinoma was made. Coeliotomy revealed a small uterus with a walnut sized, sub-peritoneal fibroid on its anterior surface close to the cervix. The right tube was slightly thickened. The left tube was enlarged at the fimbriated end to the size of a six weeks' tubal pregnancy and was attached to the sigmoid. A supra-vaginal hysterectomy and bilateral salpingo-oophorectomy was done. Sections were taken from the small uterine growth, both tubes, and the enlarged portion of the left tube. Section through the latter area showed, grossly, a cheesy material.

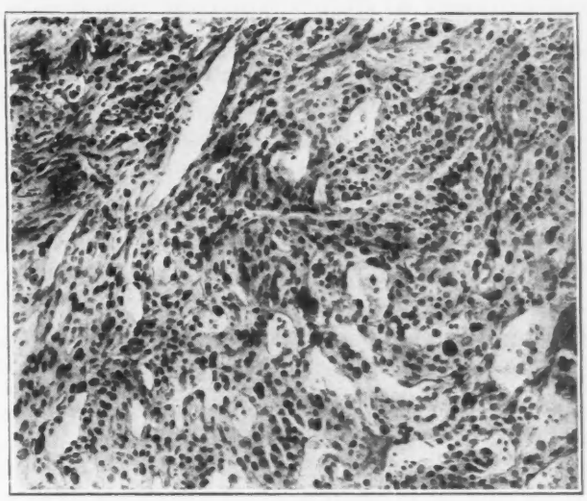

FIG. 1.—A high power microscopic picture of the tumour cells and their arrangement.

Microscopic examination showed the uterine growth to be constructed of a finely woven connective-tissue structure. The sections from the right tube and proximal portion of the left tube gave evidence of an exudative and productive salpingitis. Sections through the growth in the left tube showed a complete obliteration of the lumen and mucosa and replacement with dense masses of large, oval, immature, irregular-staining epithelial cells. In some areas these tumour cells had a poorly formed acinous and columnar arrangement. There was little connective-

* From the Royal Victoria Montreal Maternity Hospital.

tissue stroma accompanying the growth. The serosa of the tube had remained intact.

The patient was free from symptoms until October 30, 1930, when she was re-admitted to the hospital complaining of pain in the left lower quadrant of the abdomen. An irregular nodular mass was palpable in this region. Coeliotomy revealed numerous adhesions to the abdominal wall and between the loops of bowel. The retroperitoneal lumbar glands were enlarged and at the sigmoid flexure there was a nodular mass which partially surrounded the bowel. Sections were taken from this mass and showed, microscopically, a similar growth to that seen in the Fallopian tube five years previously.

COMMENT

In this case the carcinoma arising primarily in the Fallopian tube metastasized by invasion of the subepithelial structures of the mesosalpinx and by means of the lymphatic channels in this region drained toward the lumbar glands.

Metastatic carcinoma of the Fallopian tube is described by Glendining[1], who states that cancer cells floating on the peritoneum and swept toward the fimbriæ of the tube may penetrate the non-endothelial parts of the fimbriæ and ovary and invade the lymphatics of the mesosalpinx. The more common method, however, is by means of the lymphatics and blood vessels.

Primary carcinoma of the Fallopian tube most commonly arises in the outer portion of the ampulla near the fimbriated end.

Owing to the larger and more numerous folds together with a greater proliferation of epithelium, the increased hyperæmia of the cavernous portion of the tube associated with menstrual changes, and the vulnerability of the ampulla to bacterial hyperæmia, carcinomatous changes of the Fallopian tube should not be a rarity.

Doran[2], in 1910, reviewed the entire literature of carcinoma of the tube up to that period and reviewed each case individually. Of the 38 cases described by him, 10 occurred in the right tube, 12 in the left, 12 bilaterally and 4 were unclassified. In the same year Spencer[3] reported 3 cases of primary carcinoma of the tube and showed diagrams of each.

Tate[4] reported a case of primary carcinoma of the tube associated with an acute inflammatory condition and also a case of bilateral carcinoma of the tubes with involvement of the appendix.

Legg[5] reported a case of malignant papilloma of the tube and in May 1931, Rabinovitz and Horton[6] illustrated an additional case of primary carcinoma of the tube.

For the macroscopic appearance, behaviour of the growth and the microscopic study of carcimoma of the Fallopian tube refer to Frankl[7] in Leipmann's Handbuch der Frauenheilkunde.

I am indebted to Mr. W. J. Plumpton for the technical study of this case.

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4. TATE, *J. Obst. & Gyn. Brit. Emp.*, 1910, **17**: 35.
5. LEGG, *J. Obst. & Gyn. Brit. Emp.*, 1910, **17**: 38.
6. RABONIVITZ AND HORTON, *Am. J. Obst. & Gyn.*, 1931, **21**: 689.
7. FRANKL, Leipmann's Handbuch der Frauenheilkunde, Band 2, Leipzig, 1914.

While working on the Aschheim-Zondek reaction, and employing rats instead of mice, Dharmendra (*Indian J. Med. Res.*, 1931, p. 239) noted the effects of injections of pregnancy urine on male rats. It was found that in immature animals the testicles hypertrophy and descend into the scrotum, and that the seminal vesicles, prostate, Cowper's glands, and penis hypertrophy. In older animals with descended testicles, the hypertrophy of these structures is marked; the effects on adult rats are, however, variable. In view of these findings a modification of the test, using male rats, is suggested, descent of the testicles in the injected animals being the sign of a positive reaction. This obviates killing the animals, and the necessity of obtaining animals of definitely known age.—Abs., *Brit. M. J.*

STREPTOCOCCAL AGGLUTININS IN RHEUMATOID ARTHRITIS.—Edith E. Nicholls and Wendell J. Stainsby describe experiments in which they noted that the serum of patients with rheumatoid arthritis give a strong specific agglutination reaction with "typical strain" streptococci recoverable from the blood and joints of patients with rheumatoid arthritis. Such a reaction suggests that this type of hæmolytic streptococcus is of etiological importance in the disease. A close, antigenic relationship between "typical strain" streptococci and the hæmolytic streptococci from scarlet fever and erysipelas is established. Rheumatoid arthritis can be differentiated from osteo-arthritis, chronic gout, gonococcal arthritis and other joint diseases by the agglutination reaction. The agglutination reaction when supplemented by the sedimentation test, not only offers a valuable aid in differential diagnosis of arthritic conditions, but also affords an estimate of the activity of the disease and the progress of the patient.—*J. Am. M. Ass.*, 1931, **97**.

In the history of medicine there are many names associated with the discovery of facts, with learned treatises, and with technical achievements of one kind or another; there are relatively few of whom we think especially as physicians, in the sense in which this word is used in regard to Sydenham, for instance. It is a rare blending of learning and humanity, incisiveness of intellect and sensitiveness of the spirit, which occasionally come together in an individual who chooses the calling of Medicine; and then we have the great physician.—Hans Zinsser.

Editorial

THE CAUSE OF THE PAIN IN ANGINA PECTORIS

EVER since the classical description of angina pectoris by Heberden in 1768 the problem as to the cause of the pain has intrigued the minds of the medical profession and has led to much speculation. Even now, though we have more information, we cannot say that we have the full explanation. Edward Jenner was the first to link up angina pectoris with the coronary arteries, an idea that was put more plainly later (1799) by Parry. The latter observer thought that the supply of blood to the heart was interfered with by the rigidity of sclerosed coronary arteries. Under ordinary circumstances sufficient blood might reach the heart to meet its needs, but if there was an extra call the supply might become insufficient. This theory was based on an anatomical and physiological fact, but failed to explain the production of pain. Allan Burns[1], in 1809, was the first to see the analogy between angina pectoris and a limb "begirt by a ligature," but he did not mention pain as occurring in a limb when it was exercised under conditions where the blood supply was impeded. Brodie, in 1846, compared arterial disease of the leg, as indicated by gangrene of the toes, with angina pectoris, but he, also, did not speak of pain. It was not until twenty years later that Potter called attention to the resemblance between intermittent claudication in a limb and the pain of angina pectoris. By 1899 Huchard[2] was able to collect some eighty theories as to the cause of anginal pain. Most of these have not stood the test of time. Indeed, only three remain at the present as worthy of special attention.

First, cardiac pain may be due to a decreased supply of blood to the myocardium or some part of it, caused either by arteriosclerotic thickening, coronary thrombosis, or by a temporary spasm of the coronary arteries, the last a view first promulgated by Allan Burns, and accepted, later, by Blackhall, See, and Huchard.

Secondly, cardiac pain may be due to stretching of an inflamed aorta or aortic ring under the influence of exercise (Parry, Allbutt, Wenckebach, and Vaquez).

Thirdly, cardiac pain may be due to exhaustion of the heart muscle, either from deficient blood supply or from extensive degeneration of the heart muscle from other and outside causes (Mackenzie). This theory seems to carry with it the idea that there is at work some poisonous substance which is heaped up in the cardiac muscle under such circumstances.

Underlying the three conditions mentioned under the first category is the idea of ischæmia or anoxæmia of the cardiac muscle, and this explanation for anginal pain is accepted by the majority of clinicians today as adequate for most cases.

Sir Clifford Allbutt's theory that dilatation of an inflamed aorta will produce pain through irritation of the nerve terminals in its wall is generally recognized as inadequate. Admitting that a diseased aorta may become dilated the pain is just as likely to be caused by inadequacy of coronary blood supply, for the coronary arteries are always sclerosed, either throughout their length or, at any rate, at their orifices, and dilatation of the first part of the aorta would be likely to cause kinking, a condition of things that would be serious where the lumen of the coronaries is already too small. Anoxæmia, here also, is a possibility and a probability.

Sir James Mackenzie's theory is of interest in connection with the work of Sir Thomas Lewis, to be referred to shortly.

It may be remarked, in passing, that cardiac pain may be induced reflexly, as from the splanchnic area, but such pain can hardly be regarded as true angina, though apt to be confused with it. We may speculate here whether the stimulus from outside the heart causes either a reflex vasoconstriction of the coronaries, in other words, a spasm, or is a radiation effect. We need not discuss this.

Dr. Charles W. Greene[3], speaking before the Missouri State Medical Association

1. Burns, Observation of some of the most frequent and important diseases of the heart, James Muirhead, Edinburgh, 1809.

2. Huchard, Traité clinique des maladies du coeur et de l'aorte, Gaston Doin, Paris, 1899.

3. Greene, *J. Am. M. Ass.*, 1931, **97**: 130.

recently, accepts the discovery that there are efferent vaso-constrictors through the vagus and efferent vaso-dilators through the branches of the upper thoracic sympathetic nerves which are distributed to the heart by the cardiac plexus. While he admits the rôle of thrombosis and vaso-constriction as causes of anginal pain in some cases, he advances the new concept that relative cardiac asphyxiation may be due also to the failure of non-resilient coronary arteries to dilate. He holds that vaso-dilatation is more readily brought about, even in health, than is vaso-constriction. If this be so it is a somewhat saving grace. Naturally, spasm of a coronary artery, or narrowing of its lumen from sclerosis, will hinder the flow of blood to the part concerned—ischæmia and anoxæmia; if a coronary artery fails to dilate sufficiently when it should do so the result is the same.

It is well to recall at this point that the heart has, fortunately, great reserve power as befits an organ that is always, normally, under considerable stress and which never rests as rest is ordinarily understood. Not only is there a superabundance of a very efficient type of muscle, but there is also, contrary to former teaching, a fairly free blood supply through the coronary arteries and their branches. In a recent radiographic study, Dr. W. Wyn Jones[4] has stated that he has discovered that eleven per cent of hearts possess *three* coronary arteries, and, further, has confirmed the statements of other workers that anastomosis between the branches of the coronary arteries becomes more extensive as age creeps on. Gross, also, some years ago now, showed that the thickening of the epicardium with the deposition of fat which takes place with advancing years adds a vascular sheath to the heart which establishes anastomotic communications with the vessels of the underlying muscle. This being the case, we can understand how, if we can pass the age at which coronary sclerosis and cardiac fibrosis are common, we can, to some extent, rise superior to these ailments. Similarly, if patients are fortunate enough to survive minor attacks of coronary thrombosis the longer they live, the more likely they are to live. That is, their hearts become adapted to the altered conditions and perform, for a time at least, their task sufficiently well. We have here a compensatory mechanism of great value.

Not only so, but the coronary arteries themselves, being notably muscular in structure, are highly responsive to vaso-constrictor and vaso-dilator stimuli. Thus they can adapt themselves, when in a state of health, at least, to extraordinary demands. The fact that the coronary arteries can dilate more easily than they can contract is of much significance. It is comparatively easy, therefore, for an adequate supply of blood to reach the heart at all times under normal conditions. Should, however, the coronary arteries be sclerosed their response to vaso-motor stimuli is impaired; if their lumina are encroached upon by thickening, or, still more, if they are occluded by thrombosis, in each case the supply of blood is correspondingly interfered with. If the supply is inadequate for the demand pain will result. The production of pain, and still more the final result, depend in the last analysis on the extent of the existing anastomoses. And anastomoses depend on time.

As has already been remarked, most clinicians today accept the view that anginal pain is due to ischæmia or anoxæmia of the cardiac muscle. This conception carries with it the assumption that lack of oxygen irritates the terminals of the sensory nerves in the heart. But, is this the true explanation? Baeyers[5] has shown that the conductivity of a nerve may be suspended by deprivation of oxygen and restored when oxygen is again supplied. It is true that the loss of conductivity is not immediate, but one would think that in the case of coronary thrombosis, where the affected area of the heart is for a long time and often permanently deprived of oxygen, the pain induced would speedily pass off, whereas it is persistent and recurrent. There is more to be said, evidently.

Sir Thomas Lewis, in his St. Cyres Lecture, delivered on May 14th, 1931, at the National Hospital for Diseases of the Heart, advances another explanation for anginal pain, on the basis of his recent experimental work.

When the circulation in a limb is cut off

4. Jones, *Practitioner*, 1930, **125:** 370.

5. Baeyers, *Zeitschr. f. allg. Physiol.*, 1903, **2:** 169.

by means of a sphygmomanometer pain sets in after from thirty to thirty-five seconds and becomes unbearable after seventy-two to seventy-eight seconds, if the limb is being exercised. If the limb be kept at rest, no pain ensues. Again, if the observer worked his muscles until he was within two or three contractions of the onset of pain and then stopped, no pain came on. Yet, in both cases the muscles would be requiring oxygen and the usual supply was not available. Furthermore, if the load on the muscle or the rate of contraction was increased the onset of the pain and the point at which it became unbearable were hastened. The onset of the pain, then, was clearly determined by the energy expended by the muscle. A clue to the origin of the pain was obtained. Sir Thomas thought, through a series of simple experiments. In the first of these the circulation was cut off and the limb exercised until the pain had reached a certain level of intensity. Work was then stopped and it was found that so long as the ligature remained in place the pain persisted at the same level of intensity. When the ligature was removed the pain disappeared in from two to four seconds. For these reasons he concluded that the pain had a chemical or physico-chemical basis. He believed that processes arose in the muscle fibres during these experiments which led to a change in the conditions in the tissue spaces around the fibres, and that it was this change which gave rise to the pain. Additional experiments only tended to confirm him in this view.

If anginal pain is due to ischæmia then pain ought to arise either when the work of the muscle remained normal and the blood supply was diminished or, secondly, when the work of the muscle was increased and the blood-supply became inadequate. Coronary thrombosis is a good example of the first situation. Lewis would explain the pain in this case, considered in the terms of muscular ischæmia, as due to the fact that the muscle continued to work, the blood supply being cut off, and the pain-producing substance, of a chemical or physico-chemical nature, became heaped up in the tissue spaces.

Coming to the theory of Parry and Allbutt that anginal pain is due to an increase of tension in an inflamed aorta, Sir Thomas holds that, if this were the case an increase in blood pressure would always precipitate an attack. This is not so. Anginal pain might come on in tachycardia, in which affection there was no increase of blood pressure. Strain on the aorta could not enter into the matter here. In some cases of aortic regurgitation, when anginal attacks supervened they came on at first after effort, but later when the patient was quiet in bed. Again, changes in the blood pressure were not the only exciting cause of the pain, for cases occurred where a patient developed no pain after exercise, but attacks might be readily induced by taking food, especially anything which required chewing. In such cases the blood pressure might rise slightly during the attack but it did not fall when the pain disappeared, and a much higher blood pressure was produced by exercise, without inducing an attack.

We shall look for further light along the lines of these most important studies.

A.G.N.

THE POSITION OF ATHLETICS IN THE UNIVERSITY CURRICULUM

THE place that athletics should hold in the curriculum of a modern university has for the past few decades been a source of difficulty and anxiety to educational authorities. So much so that at the request of many of the higher and more important educational institutions in the United States the Carnegie Foundation for the Advancement of Teaching undertook in January, 1926, a thorough investigation of the whole subject of athletics as they then existed in American and Canadian universities. This investigation secured at the outset the willing co-operation of all the important universities and higher seats of learning in both countries. It took more than three and a half years to complete, and was preceded by a visit to the more important institutes in Great Britain and on the Continent in order to establish a basis with which to compare the conduct of athletics on this continent.*

*Carnegie Foundation for the Advancement of Teaching. Bulletins 23 and 24.

Fresh attention has been called to the advice in the report, furnished by this Investigating Committee, and to the importance of authoritative supervision over intercollegiate athletics by the recent statement of the Associated Press that thirty-one students had met with fatal accidents during the past year while playing football.

Outdoor sport, in the form of games which test skill and endurance, has always been regarded as a source of benefit to the health of all engaging in them. Under proper guidance athletic sports should serve society in the physical and moral training of youth as well as in furthering activities which, as a source of increased energy and strength, enrich life and add to human happiness.

British educators have for many centuries warmly supported games as a vital force in the education of youth. For children over ten years of age the supervision and regulation of sport has been regarded as too important to be left to chance, and all games in educational institutes have been carried on under the guidance of teachers. In the greater number of schools and colleges in America athletics were for long regarded as playing a very minor part in education, and were left in great measure under the control of the students themselves, with the result that of late years collegiate sport has acquired a definitely commercial aspect. This phase of athletics received special attention in the Foundation investigation, and was regarded as having a demoralizing influence.

As a result of this development in university sport a greater value has been placed on monetary returns and athletic *kudos* than on the moral and physical well-being of the university student. Commercialism is considered by the Foundation to be obliterating the non-material advantages of athletics, namely, the educational value of stimulation in the individual student of courage, quick thinking, keen co-operation, and honest play. The desire to win at any price has given rise to many shady actions in sport that have a lowering influence on the character of those employing such tactics. Competitive sport should always call out all a player's resources, mental and physical, but should permit at the same time honourable courtesy to his opponent. Unfair methods should be promptly condemned by all leaders of sport. The high emotionality associated with American athletics must also be regarded as a mistake, and does not contribute to just judgment.

In the course of this investigation other abuses were exposed which were in great measure attributed to failure on the part of university authorities to exercise the supervision and guidance which should have been accorded to college sport. One of the most important abuses arising from the desire of each college to win at any cost was the recruiting and subsidizing of young athletes for the college teams. Athletic students were not infrequently professionalized by direct payments or awards of various kinds, to the detriment of the intellectual aims of the college or university. The results were lamentable. The student who receives awards for his athletic services impairs academic progress in every phase of college work. His presence invokes concessions not only on his entrance to the university but almost without exception at every point at which he must meet academic requirements. Any assistance which gives an advantage to an athlete because of his athletic ability vitiates the intellectual and moral aims of an institution, and the secrecy associated with such award aggravates the effects. This abuse, which the Foundation thought had declined to some extent, was found still to have the proportions of a nation-wide commerce, and to be destroying the best influences in college sport.

The Foundation's investigation showed that the proportion of students participating in major intercollegiate athletics has remained for many years at about twenty per cent of the total number, while the percentage of those taking part in all the less strenuous forms of athletics, intercollegiate and intramural, has gradually risen from twenty to a little over sixty per cent. It also showed that athletics, well conducted, might be made to contribute significantly to the physical health of the students, but, as conducted at present, too few received benefits and too many incurred positive harm as the severe athletic practices in training and play jeopardize the well-being and may threaten the life of the participants. Still further, college athletics, as conducted today, defi-

nitely fail in many institutions to utilize and strengthen such desirable social traits as honesty and the sense of fair play.

The Foundation dealt with and studied about forty athletic conferences in the United States and Canada, and, while it reported that in an increasing number of the conferences the control of athletics by the faculty was demanded, it failed to understand the logic of a representative body which in one paragraph of its regulations emphasized the importance of upholding the status of the amateur in the university, in another countenanced the remission of college fees because of athletic prominence.

In an editorial in a recent number of *The Lancet*[1] complaint is made that in some universities, under the spell of personal proclivities or collegiate rivalries, a wrong sense of values in sport has been created, and a waste of time takes place which should be devoted to the more serious features of a future career. This statement applies, it considers, with special force to medical students to whom more liberty is conceded in respect to the variety of ways in which they may spend their leisure, than to students in other faculties, as they are regarded as having arrived at a stage when they are face to face with the serious affairs of life. Dr. Izod Bennett[2], Dean of the Middlesex Hospital Medical School, at the opening of the October session last year, appeared to view public school training with its traditional athletic associations as an unfavourable preliminary to the pursuit of medicine. In his address he said "Schools and universities of the United Kingdom have in the past gained for the country a reputation of pre-eminence in the world of sport. I fear that the omission of the usual reference to such activities may prove disappointing to many people present. The Middlesex Hospital Medical School, however, is an institution for work. More than that, it is an institution devoted to work of great severity and of a high intellectual quality. The policy of its council is to recognize this fact and to encourage it." Should not this statement apply to Canadian Universities as well as to an English one?

A.D.B.

1. *The Lancet*, 1930, **2**: 807.

2. *The Lancet, loc. cit.*

Editorial Comments

The League of Nations' Health Organization

The Permanent Commission on Biological Standardization of the Health Organization of the League of Nations gives further evidence of its very real value to medical science in all countries, in this the seventh of a series of communications dealing with the activities of the Commission.* This report includes statements relating to efforts to secure suitable international standards for gas-gangrene antitoxin (perfringens), gas-gangrene antitoxin (vibrion septique), tuberculin, toxins for the Schick test, diphtheria prophylactic, etc. To the report of the Committee itself there are annexed memoranda and protocols upon which are based the recommendations of suitable standards for the biological products above mentioned. In addition, for the first time, international standards were adopted for the following:— (1) fat-soluble vitamin A (for this purpose carotene was accepted as an international provisional standard of reference for vitamin A); (2) the antirachitic vitamin D; (3) the antineuritic vitamin B (also known as vitamin B_1); and (4) the antiscorbutic vitamin C. This marks a very real advance, the significance of which will likely be realized even more fully as time passes.

In addition to the members of the Commission itself representative bacteriologists, physiologists and biochemists from England, France, Germany, United States of America, Denmark, Norway, Belgium, Austria, Sweden and Canada participated in the conference. Prof. Donald Fraser of the University of Toronto represented Canada and presented a valuable paper, a précis of which is included in the proceedings. In this appear the findings of an investigation undertaken by Professor Fraser, Professor Moloney, and their collaborators in the Connaught Laboratories. This investigation had as its object the determination of the reaction, in a series of 294 individuals, to three standardized Schick test toxins. The results obtained were supplemented by a parallel assay of diphtheria antitoxin content of the blood of these persons. This latter procedure was carried out in rabbits by the method of Fraser and Wigham.

The whole report merits careful and thorough

* Report of the Permanent Commission on Biological Standardization, London, June 23, 1931, price 1/6 ($0.40), Geneva, 1931.

study, not only by specialists interested in biological products but by physicians generally.

J.G.F.

The International Hospital Association

Immense possibilities for the development of hospital work throughout the world have been created by the recent formation of the International Hospital Association, and an appeal has gone forth for more members in Canada. This association was formed last June on the occasion of the second International Hospital Congress in Vienna which was attended by delegates from all parts of the world. In order to ensure its vitality, provide it with adequate resources, and strengthen its international character, it is essential that the greatest possible number of individuals and institutions be enrolled as extraordinary members of this International Association. Ordinary membership is open to the national hospital associations and associate or extraordinary membership is open to two groups; individuals associated in some capacity with hospital work, and firms or organizations having a business relationship to hospital activities, such as architects, contractors, supply houses, etc. All personal members receive free of charge the issues of *Nosokomeion*, the new international quarterly hospital review, to which outstanding authorities in hospital and allied activities have been contributing exceedingly valuable papers. The numbers already issued have given a glimpse of to what extent these international exchanges of viewpoint and experience may benefit individual hospitals or countries in their efforts to improve their own hospital methods. All individual members are entitled to attend the conventions, which will be held at frequent intervals on this continent, and will have an opportunity of participating in the work of the permanent committees.

The annual subscription for individual hospital workers is five dollars, and for firms or persons having business relationships with hospitals the membership fee is ten dollars. Subscriptions may be sent directly to the Secretary-Treasurer, Dr. E. H. L. Corwin, at 2 E. 103rd Street, New York City, or to Dr. Harvey Agnew, 184 College Street, Toronto 2.

G. H. AGNEW

William Harop Hattie

The widely regretted death of Dr. William Harop Hattie, of Halifax, N.S., which occurred suddenly on December 4, 1931, has removed from the ranks of our profession one of its outstanding figures. In his time he played several parts and played them well. His was a singularly full life, and every cause which he espoused he left the better for his association with it.

A graduate in Medicine of McGill University in 1891, Doctor Hattie was, shortly after his return to his native province, appointed Assistant Superintendent and eventually Superintendent of the Nova Scotia Hospital (for the insane), the efficiency of which institution he raised to a high level. He resigned this post in 1913, to become Provincial Officer of Health for Nova Scotia. Here, again, he did yeoman service, notably in the direction of obtaining and recording more accurately the vital statistics of his province and improving the condition of asylums and penal institutions, of which he was inspector. Then, in 1922, when the Medical School of Dalhousie University was being refashioned, he gave up his office to become the full-time Professor of Mental Diseases and of Hygiene and Public Health in that institution, Secretary of the Faculty, and, later, Assistant Dean. During this period the Dalhousie Public Health Clinic, made possible by the generosity of the Rockefeller Foundation, and one of the best buildings of its kind in America, was erected and Doctor Hattie had much to do with its planning and became its Director. During the strenuous times of the War he was attached to the General Staff, with the rank of Captain, acting as Sanitary Officer for the Province, for which duty his special knowledge and zeal rendered him eminently suitable.

For some years past Doctor Hattie was associated with the *Canadian Medical Association Journal*, and not long since became a corresponding member on the Editorial Board, to which his wide knowledge and facile pen made him a valuable acquisition. He was writing for the *Journal* when stricken with the illness which, so sadly, proved fatal later in the day.

In all his associations Doctor Hattie was a wise counsellor and efficient administrator. Genial in disposition and tactful in diplomacy, he could always be depended on to find a satisfactory solution for any difficult problem. If any qualities in his character stood out in greater relief than did the others they were his honesty and his dependableness. Truly, he was the Christian gentleman and a trusty friend.

His colleagues on the Editorial Board of the *Journal* desire to place on record their testimony to his worth and their deep sense of the loss which the *Journal*, and they, personally, have sustained.

A.G.N.

Dr. J. H. Elliott

Announcement has been made recently that Dr. J. H. Elliott has been appointed Professor of the History of Medicine at the University of Toronto, in the room of Professor (General) J. T. Fotheringham, C.M.G., M.D., LL.D., who has resigned. The new professor has had a brilliant career. He graduated from the Uni-

versity of Toronto (M.B.) in 1897, winning the Gold Medal and Honours in all subjects, as well as the "George Brown Memorial Scholarship." After graduation he spent a year in reasearch in physiology, and, in 1900, was sent by the Liverpool School of Tropical Medicine to study malaria and other tropical diseases in Nigeria. He has held numerous high offices in various medical organizations, and is a Fellow of the American College of Physicians and of the Royal College of Physicians of Canada. His work in regard to tuberculosis is well known, and he has written upwards of fifty papers on medical subjects.

Doctor Elliott has always taken a great interest in the historical side of medicine, and has devoted much time to the collection of old books and materials relating to medical history, from which the Academy of Medicine of Toronto has received much benefit. He was the first president of the Medical History Club of Toronto, and was largely instrumental in establishing the Section of Historical Medicine of the Canadian Medical Association, of which he was secretary. He is also at the present time Vice-president and Honorary Librarian of the Canadian Military Institute.

Doctor Elliott is the efficient editorial correspondent for the Province of Ontario of the *Canadian Medical Association Journal*, and his colleagues congratulate him on his appointment to a post which will be so much to his liking and which they know he will fill with great distinction. A.G.N.

Dr. Ross Mitchell

Dr. Ross Mitchell, of Winnipeg, assumed the office of President of the Manitoba Medical Association on October 22, 1931. Doctor Mitchell is Associate Professor of Obstetrics, University of Manitoba, and Chief Obstetrician to the Winnipeg General Hospital. He has been Editor of the *Manitoba Medical Bulletin* for many years and is entirely responsible for its notable growth and progress. In his quiet unobtrusive way he has done a great deal for the profession in Manitoba. Doctor Mitchell is also a Corresponding Editor of the *Canadian Medical Association Journal*, and his confrères on the Editorial Board join with those in Manitoba in congratulating him on his election to his high and important office. A.G.N.

A New History of Medicine in the Province of Quebec

Any new book dealing with the history of medicine in Canada, written by an author of repute, deserves more than perfunctory comment. We desire, therefore, to draw special attention to a work entitled "History of Medicine in the Province of Quebec," from the pen of Dr. Maude E. Abbott, McGill University, Montreal, a full review of which appears elsewhere in this issue. This pleasing production presents in a lucid and attractive form the principal facts relative to the development of the practice and teaching of Medicine in the old storied province of Quebec. While restricted in its locale it is unrestricted in its appeal, and should be read by every member of the medical profession desirous of being well informed in the history of his calling, and, indeed, by all who delight in a good subject well presented.

A.G.N.

Kruseman's Medical Art Calendar

The *Journal* has received again, this year, from the publisher, J. Philip Kruseman, of The Hague, one of his charming medical art calendars. These calendars have been issued for fourteen years now and constitute a most interesting and valuable series of pictures relating to medical men and their work. In the case of some of the issues the publisher has had the advantage of the cooperation of a strong advisory committee, consisting of Drs. A. Sikkel, J. G. De Lint, and J. B. F. Van Gils.

The issue for 1932 contains twenty-six reproductions, mostly of paintings by well known Dutch artists, among whom are represented David Teniers the Younger, Jan Steen, David Teniers the Elder, Jacob Jordaens, Thomas Wijck, Nicolaas Knupfer, J. C. Droogsloot, A. Ter Plegt, Barend Fabritius, J. M. Molenaar, Gerrit Lundens, Jacob Ochtervelt, and Jan Verkplje, as well as some satirical drawings, and engravings by Houbraken and A. Cardon. The subjects illustrated are The Alchemist, The Village Surgeon, The Pool of Bethesda, The Consultation Hour of Boerhaave, The Visit of Hippocrates to Democrates, The Tooth-Drawer, The Scholar, The Bleeding, The Examination of Urine, The Sick Woman, and the like; there are portraits of Van Bavegem (noted for his treatise on Cæsarean section). Van Leeuwenhoek, Bidloo, Albinus, and Burmannus; and there is, also, an interesting drawing of the Botanical Garden at Leyden in 1725. The work is well executed and should prove of great interest to all who are interested in doctors and their work as dealt with in pictorial art. We believe that all the pictures that have been published to date can be obtained in suitable albums from the publisher. The price for each issue in an album is eight shillings and sixpence; six different albums for two pounds four shillings; the whole series of thirteen albums, of which a few only are left, is to be had at five pounds.

A.G.N.

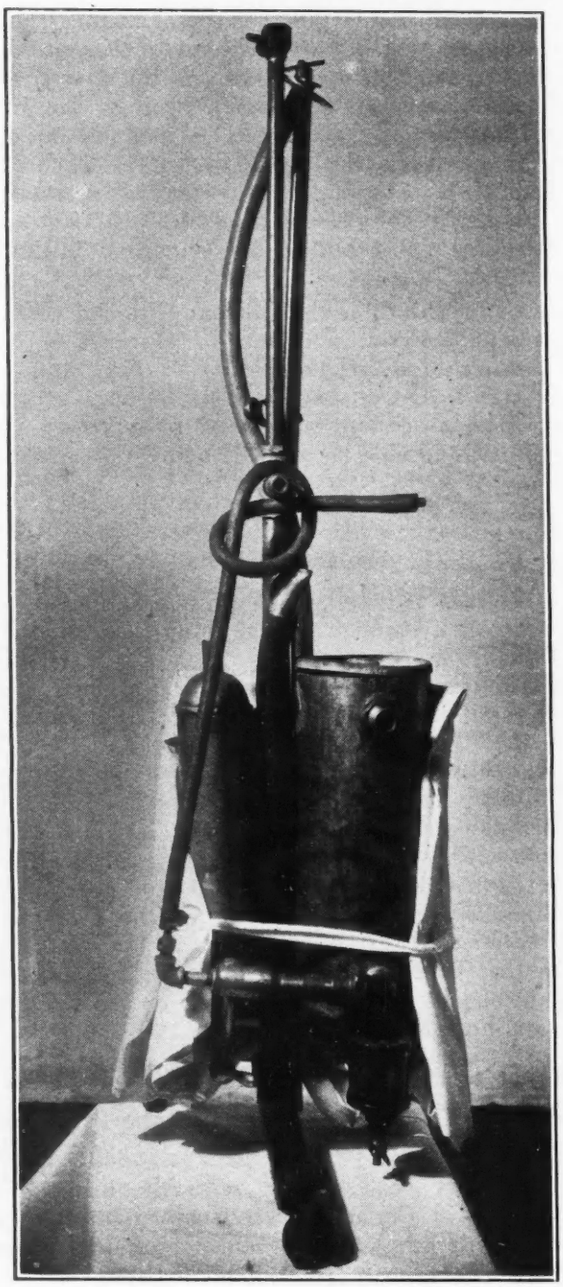
Clinical and Laboratory Notes

A NEW PORTABLE OXYGEN TENT*

BY NELLES SILVERTHORNE, M.B. AND
ALAN BROWN, M.D., F.R.C.P. (C.),
Toronto

The necessity arises at times for the use of the oxygen tent in the treatment of pneumonia in private homes. Until the construction of the present apparatus it has always been a cumbersome, as well as destructive, procedure, to move from institution to home the tents used in the past few years in the Hospital for Sick Children. On account of these considerations, as well as the high cost of manufacturing the tents used in the past, a simplified portable and more economical machine has been devised, the details and photographs of which accompany this description.

It was believed that the present oxygen tent could be improved upon as regards the features above mentioned. With some patients the electric motor which propels the fan to keep the air circulating is disturbing, and there is the fact that many homes in outlying districts have not the benefit of electricity. To overcome this difficulty an air injector has been substituted which creates as good a current of air as the motor. The tent itself, made of rubber with one window, can be conveniently removed from collapsible braces which hold it expanded from the four corners. The tent then may be wrapped and tied around the base of the machine. The arm which holds the collapsible braces slides down into the main upright. The collapsed braces with attached extension, may also be placed inside the hollow upright. The upright is attached to a 3-wheel base. The ice chamber and soda lime chamber are much smaller, and are attached to the upright by a sliding arm which can be adjusted for high or low beds. The tube carrying the cooled oxygen is short and has a fish-tail end which can be placed under one curtain of the tent. Both the inlet tube and outlet tube to the soda lime chamber are non-collapsible, and may be unfastened from the tent and placed alongside the upright. The three-wheel base, as is seen in the photograph, can be conveniently placed well under the bed, thus economizing space, which is an added feature. From the upright is attached a small horizontal handle to which is fastened the oxygen measuring gauge and releasing valve. The whole machine may be easily lifted and carried by one person in this way. The photographs illustrate the tent in position over a patient, and ready for moving to the home. The cost of manufacture is roughly estimated at from one to two hundred dollars, which has reduced the expenditure per machine three to four hundred dollars and still provides the same efficiency as regards the patient's comfort. In testing the percentage of oxygen delivered in the tent, 10 c.c. samples of the air in the tent were taken from three to four different places, and when the releasing valve registered 7 litres per minute one found that within half an hour the percentage of oxygen was between 50 and 60.



* From the Sub-Department of Pædiatrics, University of Toronto, and the Hospital for Sick Children, Toronto.

This can be raised by increasing the number of litres per minute delivered into the tent. These readings have been found so constant in all tents used in the past few years in this hospital that for practical purposes it was not deemed necessary to have an oxygen measuring apparatus attached. The oxygen tank is separate and may be carried apart from the tent; when in use it may be placed beside it or on a platform at the back of the three-wheel base, by adding a triangular extension and a fourth wheel. This tent has been tried on older children with pneumonia and other conditions producing cyanosis and is just as comfortable, oxygenates them as well, and in every way produces the same result as the other tents. In fact, the simplicity adds to its efficiency, requiring less attention in regard to repairs.

In conclusion, the authors feel that this oxygen tent is definitely more practical than the ones used in the past. It combines portability, simplicity, and expert efficiency with a great saving economically.

Special Articles

THE ANATOMY OF THE EYE IN THE SEVENTEENTH CENTURY*

BY WILLIAM D'A. MAYCOCK,

Montreal

To appreciate the conception of the eye's structure in the seventeenth century it is necessary to know something of the progress made in the preceding century, which had seen the revival of anatomy under Vesalius (1515-1564), Leonardo da Vinci (1452-1518), and their followers. The general conception of the anatomy of the eye was still that of Galen and the Arabians, but certain outstanding discoveries were made which helped to put an end to the mediæval viewpoint. Vesalius discovered the magnifying properties of the lens and shattered the belief that it was the vital part, but he fell into the common error of describing the lens as situated in the centre of the eyeball. He explained that the colour of the iris was due to pigment in the iris itself and not to the humours of the eye. Fallopius (1523-1562) accurately described the levator palpebræ superioris muscle for the first time, although work had been done on it by Aranzi (1536-1589), who first noted the lateral entry of the optic nerve into the eyeball. Fallopius also explained the course of the superior oblique through the pulley and traced the trochlear nerve from its source to its termination in the muscle. He is generally credited with the discovery of the ciliary ligament, but several historians assign this honour to Galen. And, lastly, the conjunctiva was separated from the rim of the orbit and described by Nicol Massa (1499-1569) and Berengario da Carpi (1470-1536). It is typical of the conservatism of the time, and illustrative of the difficulties preventing the rapid diffusion of new discoveries and ideas, that this new knowledge was not generally accepted. DuLaurens (1558-1609), in a little book published just before the close of the century, gives a picturesque and popular description of the anatomy and physiology of the eye, in which he considered the lens the chief part, and all other parts as subservient to it. "The cornea serves as a window pane, and the pupil as a window, the uvea as a garden where it can cheer itself when too tired; the cobweb as a means of holding its parts together, the aqueous humour as a foreguard to stop and break the first attack of objects that would enter too quickly, the vitreous humour as a cook, preparing and bleaching its meat, the optic nerve as a courier bringing to it the power and order of sight and returning quickly what the crystal has seen; the muscles are its horses, raising it up, down, to the right, to the left and wherever it pleases."

The first work published in the seventeenth century, "De Auditu, Visione, Voce" (1600), by Fabricius (1537-1619), contains one very important discovery—the position of the lens in front of the centre of the eyeball, but other-

* From the Department of Anatomy, McGill University, Montreal.

wise the section on the eye is more complete physiologically than anatomically.

From this point it will be more convenient to consider separately the parts of the eye and the developments in their anatomy that took place in the seventeenth century.

The lids.—The function of the lids seemed of more importance to the anatomists of the first part of the century than their anatomy. Casserius, of Padua, (1561-1616) stated that they consisted of skin, muscles, two in the upper lid, one in the lower, tarsal plates, and a posterior membrane (the conjunctiva) derived from the pericranium. The eyelashes he thought were inserted into the tarsi. He mentioned also holes along the margins of the lids which were the orifices of the tarsal glands, but their true nature and function were not known to him and his description of them is usually termed "inadequate." Helkiah Crooke (1576-1635) in his "Description of the Body of Man" (1631) compares the lids to penthouses and gives the same description as Casserius. Henry Meibom (1638-1700), Professor of Anatomy at Helmstadt, gave the first accurate description of the tarsal glands in "De vasis palpebrarum novis" (1688). "Si invertas tarsos," he says, "videbis utrinque corpora glandulosa, ampliora in superiore: quæ si accuratius contempleris, et cultellum quoque admoveas, totidem distinctas minimas glandulas observabis, quot in limbo tarsorum sunt ostia." The ducts of the glands in the upper tarsus are long and tortuous, while in the lower they are short and straight. He proved that the glands had cavities by compressing the eyelids, whereby a liquid was forced out of the holes along the margins. The openings of the excretory ducts were also described by Ruysch (1638-1731), who observed numerous nervous papillæ in the conjunctival layer of the lids.

Lachrymal gland.—At the beginning of the century the anatomy of the lachrymal gland, its ducts, and accessory passages was by no means clearly understood, because the source of the tears and the function of glands had not yet been discovered. It was thought that the tears were products of the brain, from which they were squeezed by contraction; they were then supposed to pass through the nerves and minute apertures of the eye towards the front of the orbit where they were sucked up by the lachrymal gland. Their function was to lubricate and cool the eye. Even Wharton (1614-1673) held these views.

The exact number and position of the so-called glands was a debatable point. Casserius placed the gland in the internal angle of the eye, presumably confusing it with the caruncle, and Crooke describes two, one at each angle, making the same mistake as Casserius with regard to the caruncle. Jean Riolan, the younger (1577-1657), differentiated the caruncle from the gland, but Nicolaus Steno (1638-1688) described ducts leading from it. Steno was the first to discover the main ducts of the true lachrymal gland, although some claim that these and the other parts of the lachrymal apparatus were known to Galen, and he immediately gave the one correct explanation of the secretion of tears when he maintained that the tears were the produce of the gland and had origin from the arterial blood through the influence of nerves on the gland; that the normal function of the gland was to keep the surface of the eye and lids smooth, and that this fluid afterwards passed through the puncta lacrimalia and lachrymal canals, which were also first observed by Steno, and through the naso-lachrymal ducts to the nose.

Duverney (1648-1730) described the lachrymal sac and ducts in some detail. The upper duct, he said, was curved in the middle of its course, running at first up and then down, while the lower followed a more horizontal course. Ruysch described the ducts of the gland and worked on the lachrymal passages which had been well described by Fallopius. Riolan, Casserius, and Nuck (1650-1692), also devoted much time to the study of the lachrymal passages, but both Riolan and Casserius thought that the tears were produced by them and absorbed by the gland. P. Dionis (*ca.* 1658-1718) said that the gland was supplied by the fifth and sixth cranial nerves and derived its blood supply from the carotid artery, and explained the caruncle as the junction of the internal layers of the lids. William Briggs (1642-1704), in his Ophthalmographia (1676), described lymphatics connecting the gland with the upper lid and ciliary processes.

The eye muscles (palpebral and bulbar).—Casserius gives a long description of the eye muscles. He divided the orbicularis oculi into orbital and palpebral portions, the latter being joined to the tarsal plates. The origin and insertion of this muscle were given by most anatomists as the internal and external angles of the eye; the fact that there was no lateral bony insertion seems to have escaped notice. Some authors doubted the existence of a muscle in the lower lid, but Caspar Bauhin (1550-1624) claimed that the lower lid moved a little and therefore was muscular in structure. Riolan separated out the fine fibres in the margin of the upper lid which still bear his name, but the distinction was considered artificial by contemporary anatomists. The medial palpebral ligament was more apparent than real according to Santorini (1681-1737), who claimed that the interdigitation of the muscle fibres from the upper and lower lids imparted

to it its tendinous appearance. He divided the orbicularis oculi into two separate parts, one for each lid, and also differentiated a corrugator palpebræ muscle.

Casserius described the levator palpebræ superioris as taking origin from the optic nerve and spreading out into a thin tendinous sheet which was inserted into the cilia of the lid. Dionis gave the right origin—the surface of the bone above the optic foramen.

The origin of the recti muscles was not correctly described until Valsalva (1666-1723) broke away from the conventional conception and stated that the recti muscles adhered to the sheath of the optic nerve forming a ring. He did not mention however their additional origin from the sphenoidal bone. Casserius described the origin as stretching from the middle of the optic nerve to the sphenoidal bone, while Crooke said that they arose only from the sphenoidal bone. Rolfinck (1599-1673) and Dionis gave the origin as the circumference of the optic foramen, and John Browne (1642- *ca.* 1700) the "bone by the entry of the optic nerve." The insertion of the recti into the sclera was well known, but the tendons were supposed to spread out and form a coat of the eyeball, the tunica innominata of Colombo (1516-1559), which served to increase the white of the eye.

The superior oblique and its pulley were well described, but its origin is usually said to be the same as that of the recti muscles. Riolan, however, gave it correctly, stating that it derived origin from the internal margin of the optic foramen near the ethmoidal bone; he also described its sheath. The inferior oblique was correctly described. In 1666, Antonio Molinetti, a Venetian, thought he had discovered a muscle which he called "le trochléateur" whose function was to help the superior oblique. The dual nature of the action of the superior oblique muscle was first noticed by the French comparative anatomist, Perrault (1613-1688), who described the action of all the eye muscles in some detail. It was generally believed that the actions of the superior and inferior recti muscles were simple—the superior and inferior merely causing upward and downward movements of the corneal surface in a vertical plane. Most writers gave a somewhat scanty, but correct, description of the nerve supply of the muscles; Willis (1621-1675), curiously enough, stated that the orbicularis oculi muscle was innervated by the oculomotor nerve, and according to Vieussens (1641-1715), this was the nerve of supply to the abducens muscle or lateral rectus.

The coats of the eyeball.—The number of coats is usually given as six, although, as Casserius said, there was great doubt as to the exact number, because it all depended on what was considered to constitute a coat. Some writers, he said, described four, following Galen's description, others seven after Ali Abbas, and others five after Avicenna. At the end of the century, however, the coats usually enumerated were six—the conjunctiva, sclera or cornea, uvea (i.e., the vascular tunic), retina, the capsule of the lens, aranea or cobweb, and the vitreous or hyaloid tunic. To these the tunica innominata of Colombo (already mentioned) was occasionally added as a seventh, but this coat fell into disfavour with most anatomists, no doubt because of the difficulty in dissecting it out.

The conjunctiva is described as taking origin from the pericranium of the bony rim of the orbit, and running down over the front of the globe as far as the iris, *i.e.*, to the margin of the cornea, on the one hand, and covering the backs of the lids on the other. Casserius mentioned that fat is occasionally found, and Crooke stated that small arteries and veins are numerous.

Duverney (also Leeuwenhoek) divided the cornea into two layers, the outer one of which he called the epidermal layer. This layer was the conjunctiva reflected over the cornea, but he does not appear to have realized its identity. The plica semilunaris is hardly mentioned at all, and it is never conceived of as being in any way comparable to the third lid in the lower animals, which was first described (in birds) by Perrault.

The cornea and sclera were described in the first part of the century as separate coats, and it was only later that they came to be regarded as two parts of one coat which was called indifferently sclera or cornea. Fallopius had already called attention in the sixteenth century to the fact that the cornea has a smaller radius of curvature than the rest of the globe. The coat was regarded by most anatomists as being continuous with the dural sheath of the optic nerve, but it was claimed to be quite separate by Duverney, who, moreover, did not think the sclera and cornea should be considered as parts of one coat as the cornea was more tendinous than the sclera. Allen Moulins (b. *ca.* 1655), who was elected a Fellow of the Royal Society in 1683, described ligaments connecting the sclera and cornea in the eye of an elephant burnt at Dublin in 1682. Casserius divided the sclera and cornea into four layers and stated that the vessels and nerves run through it to be distributed to the other parts of the eye.

The lateral entry of the optic nerve into the eyeball was noted by Aranzi in the previous century, but many writers in the seventeenth century described it as entering in the centre of the globe, and some did not mention any particular place at all. Nuck, by injection, was able to demonstrate branches of the carotid arteries in the sclera, and Ruysch detected

vessels whose nature he could not be sure of. He tentatively described them as lymphatics but was puzzled by the absence of valves. He divided the sclera into several layers. Leeuwenhoek imagined the cornea to be composed of "pellucid streaks or fibres" many of which he took to be blood vessels, and he thought that a liquid was exuded from the cornea to keep the surface of the eye moist.

The term "uvea" included the chorioid, ciliary body, and iris, but it was gradually coming to be applied only to the iris, while in the first part of the century it was applied chiefly to the choroid, the ciliary body being termed indiscriminately "the ciliary ligament" or "ciliary process," while the iris was by some authors considered a part of the retina.

The chorioid was so called, Casserius explains, because it adhered to the sclera by blood vessels. So closely did it adhere that he denied the distinction between the two coats, maintaining that they should be considered as parts of the same coat. This conception of a close connection between the two coats is of course wrong. Crooke described the chorioid as being full of veins, soft and black, and joined to the iris by weak fibres. The chorioid was considered by most anatomists as continuous with and derived from the pia sheath of the optic nerve (Casserius, Valsalva, Méry (1645-1722).) Ruysch divided the coat into two layers, the inner of which is still sometimes known as the "membrana ruyschiana", and by injection he was able to give the first detailed account of the arteria centralis retinæ and venæ vorticosæ; he also detected nerve fibres in it (short and long ciliary nerves). The division into two layers was strongly contested by J. J. Rau (1658-1719) who argued that Ruysch had altered the natural condition of the coat in his examination of it. Steno also investigated the structure of the chorioid. A curious theory that the chorioid was the vital organ of sight grew out of E. Mariotte's (1620-1684) discovery of the blind spot. Since the point where the optic nerve enters is the only part of the back of the eyeball where the chorioid is not found, Mariotte concluded that the chorioid and not the retina was the coat essential to sight. This theory ran its course into the next century, counting among its supporters several distinguished anatomists, until it was proved to be definitely wrong by Gauteron (1660-1737).

The ciliary body was described by Casserius as being spongy and joined lightly to the lens and cornea. Duverney suggested that the ciliary processes held the lens in position opposite the pupil and retained the vitreous humour. Ruysch first described the ciliary body as being thinner on the nasal than the temporal side. The muscular nature of the ciliary body and processes was known to Kepler (1571-1630) who, in his Ad Vitellionem Paralipomena (1604), gave the first, but incorrect, solution of the problem of accommodation, when he explained that the eyeball was lengthened by contraction of the ciliary processes which drew the sides of the eye toward the lens.

The iris always presented difficulties to the anatomists because of its various colours and powers of dilatation and contraction. Vesalius's explanation of pigmentation was not always accepted, and Crooke said that the colour depended on the relative positions of the lens and aqueous humour. According to Crooke, dilatation and contraction were caused by animal spirits. Fabricius explained them by assuming movement of the whole uveal tract. Christopher Scheiner (1573-1650), put forward the theory that movement was caused by muscle fibres in the iris. The existence of the sphincter fibres was admitted by Ruysch, Rau and Duverney, but the latter denied the presence of radial fibres. The circulus arteriosus major was described by Ruysch. Towards the end of the century the iris was usually considered as a fold or reduplication of the coat of which the chorioid was part, dividing the anterior compartment of the eye into anterior and posterior chambers. Duverney, however, argued that the structure of the iris was quite unlike that of the chorioid and that it should therefore be looked upon as separate. The pupillary membrane was supposed to persist for a while after birth (Riolan).

The retina was considered as an expansion of the medulla of the optic nerve, but its extent and fine structure were not known, although it is probable that Leeuwenhoek (1632-1723) had some knowledge of its microscopical composition. It was frequently confused with the hyaloid membrane and consequently described as inserting into the lens. Conrad Schneider (1614-1680) thought that it stopped at the ciliary processes, while Plempius (1601-1678) considered it as running to the ciliary body. Casserius and Crooke described it as damp, reddish and very vascular. Kepler was the first to recognize its real function (1604) and his views were accepted by most anatomists, although the conservative Crooke still regarded the lens as the vital part (1631). In 1676 Briggs described the papilla formed by the optic nerve at its point of entrance.

The aranea, or capsule of the lens, was well known. Casserius described it as pellucid and thin and taking origin from the retina. Crooke said it was thin, bright and shining and apparently nourished by vessels in the ciliary ligaments, since there were none in it. The aranea was sometimes confused with the hyaloid membrane, first described by Fallopius,

and Crooke and Duverney were careful to point out the distinction that exists between these coats, but they do not seem to have realized that a prolongation of the hyaloid membrane forms the suspensory apparatus of the lens. The presence of the hyaloid membrane was denied by Briggs, but it was known to Ruysch, who claimed that this coat was non-vascular. There was some difference of opinion as to whether the lens was covered completely by the capsule or on the anterior side only. Crooke and Duverney, both of whom noted that the capsule is thicker anteriorly than posteriorly, and Casserius held the former belief, while Vesling (1598-1649) and Steno maintained the latter. Leeuwenhoek described the structure of the capsule as closely interwoven filaments among which he imagined he saw lymphatics.

The humours of the eye—The aqueous humour was always a source of difficulty, because of its powers of regeneration. Numerous cases of the loss of the humour and its subsequent reappearance had been noted. Crooke attributed its constant volume and purity to "spermatical" origin, *i.e.*, he believed it was derived directly from the egg. Méry came nearest to the solution when he propounded the theory that it was secreted by glands in the ciliary body. Its extent was well known, but Riolan imagined that it ran back and surrounded the vitreous humour.

The vitreous humour was considered by some as a conglomeration of different kinds of extremely fine vessels which sustained a limpid transparent liquid. Riolan explained its firm appearance by suggesting that trabeculæ ran in from the hyaloid membrane, and Duverney imagined it to be composed of a number of very transparent little "cellules", all enveloped by a common transparent membrane and filled with a fluid similar to the aqueous humour; these "cellules" intercommunicated and the fluid circulated from one to the other. The extent of the humour was known and it was supposed to derive its nourishment by vessels from the chorioid.

The shape and position of the lens had been investigated in the previous century, but its suspensory apparatus was not understood, although Duverney had come near to discovering it. Crooke imagined that it was held in position by the greater convexity of the posterior surface, which fitted a depression in the vitreous humour. Leeuwenhoek elucidated the fine structure of the lens in sheep, oxen, fishes, birds, dogs, cats, rabbits, and hares, noticing differences in shape and details of structure in each. It was composed, he said, of scales, which in turn were formed of filaments which pursued an involved wavy course. At first he thought that these filaments were "globular" in structure, but after careful reconsideration he decided that what he had formerly taken for "globules" were pieces of adjacent filaments damaged in the process of separation. He calculated that there were 2,000 such scales in an ox lens, by comparing the width of a scale to the width of a hair. Leeuwenhoek found that the arrangement of filaments differed in various animals. Duverney and Steno were also familiar with the lamellated structure of the lens, and Steno's biographer claims for him the honour of being one of the first to understand the structure. According to Portal (1742-1832), Nicholas Peiresc (1580-1637) was one of the first to measure the varying degrees of convexity of the lenses of different animals. Allen Moulins described vessels running to the lens in certain animals. Ruysch at first denied the presence of any vessels in the crystal, but after a subsequent examination he decided that there were a few arterioles on its posterior surface.

The seventeenth century did not witness any very outstanding discoveries in the anatomy of the eye. Its gross structure was familiar to all anatomists and their descriptions are accurate but not detailed. In the words of Pagel, "The anatomy of the eye was enriched in the seventeenth century only by a few single discoveries, such as the finding of the membrana ruyschiana, and by the results of microscopical research which began with Leeuwenhoek's investigation of the lens." The science of optics, the birth of physiology, and the perfection of injection methods also played their parts in stimulating the examination of the eye's structure, and were directly responsible for some of the additions to the knowledge of ocular anatomy made in this period.

In conclusion I would like to thank Dr. Francis, the Librarian of the Osler Library at McGill University, for his assistance and advice in the preparation of this paper.

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Men and Books

THE MEDICAL HISTORY OF BRITISH COLUMBIA*

BY A. S. MONRO, M.D.,

Vancouver

THE PERIOD OF GOLD DISCOVERY, 1849 TO 1882

As the colonization and development of British Columbia practically had its inception about 1849 and onward, and was coincident with the discovery of gold, which brought in its train hosts of adventurers and others, many of whom became outstanding pioneer citizens of the province, a brief outline will be given of this important event in the annals of the young colony.

The departure of the Hudson's Bay Company from their Columbia River Headquarters at Fort Vancouver to Fort Victoria was scarcely accomplished when the news of the California gold discoveries became a theme of world-wide interest. Hard on the heels of the California strike in '49, Governor Blanshard, in August, 1850, reported to Earl Grey the finding of gold in the Queen Charlotte Islands. Douglas, now in charge of the Hudson's Bay Company's interests at Victoria, realizing the importance of this, fitted out an expedition in 1851 to prospect the new gold fields. While some gold was found and numerous prospecting parties investigated the gold-bearing strata, yet the amount of the precious metal recovered was so little that it did not pay the cost of the expedition, and, as a result, this field was early abandoned. The scene of the gold search now shifts southward. The earliest find is that attributed to Chief Trader McLean at Kamloops, who obtained gold dust from the natives in 1852. From that time on until 1856 various authentic reports of gold finds on the lower Fraser and Thompson Rivers were made. In 1858 came the first rush of gold seekers and by the summer of that year it was in full tide. The extent of this influx and its influence in determining the development of the mainland will be taken up in a subsequent chapter. In the meantime, important events were happening in the young colony of Vancouver Island.

JOHN SEBASTIAN HELMCKEN

In March, 1850, the ship *Norman Morrison* arrived in Esquimalt Harbour, bringing eighty pioneer immigrants, mostly servants of the Hudson's Bay Company. The passengers and crew had had a strenuous time fighting an outbreak of smallpox which had occurred during the voyage. On arrival the ship was placed in quarantine for three weeks. On the ship was a young surgeon, John Sebastian Helmcken, and much of the success in quelling the epidemic, in which only two persons lost their lives, was due to the skill and care given them by him. Doctor Helmcken was destined to achieve distinction in his adopted country, not only in his professional capacity but also as a statesman. Open-hearted, generous, genial and witty, the Doctor's spontaneous good humour and broad sympathy soon endeared him to all with whom he came in contact. No more distinguished citizen has ever graced the ranks of the profession in this province.

John Sebastian Helmcken was born June 5, 1825, in London, England, and came of pure German ancestry. His father was a native of Bremerlee, Germany, and his mother's father was a native of Miskirch, Germany.

He acquired his early education in his native city. His father having died, Dr. Graves, of Trinity Square, on Tower Hill, London, a physician well known in his day, took a liking to the boy, and very kindly gave him a position in his surgery with pay, intending him to become a druggist. Eventually young Helmcken was articled as an apprentice, during which time he had to put up all of the prescriptions, including the making of pills, which in those days was a matter entirely different from that to-day. Before the expiration of the four years' apprenticeship, he became a student at Guy's Hospital. At the end of the four years' connection with hospital, having fulfilled the legal requirements, Mr. Helmcken obtained a diploma from the Royal College of Surgeons, England, also a licence from the Apothecaries Society. During his first two years' residence at Guy's Hospital he saw all of the operations, great or small, performed without an anæsthetic. After this he witnessed the first operation performed under the newly-discovered ether, Dr. Gull administering the anæsthetic.

* The first section of this article can be found in the *Journal*, 1931, **25**: 336 and 470.

Through his strenuous work, Dr. Helmcken's health became impaired, and he was given, as a reward for merit, for he had captured several prizes during the course, an appointment to the Hudson's Bay Company's ship *Prince Rupert* on its voyage to York Factory on Hudson's Bay and return. Accompanying the *Prince Rupert* was a vessel containing a government expedition in search of Sir John Franklin, the Arctic explorer, which had to travel from York Factory to the MacKenzie River. Mr. Helmcken returned from this journey, accompanied by Dr. Rae of the Hudson's Bay Company, the celebrated explorer, who was a passenger on the *Prince Rupert.*

Restored to health Mr. Helmcken then spent another year in study and was granted his M.R.C.S., England. We next find him as surgeon on the passenger ship *Malacca,* bound for Bombay. This vessel was built by the same firm, Messrs. Wigram and Green, who, it is interesting to note, built the pioneer Pacific steamer *Beaver* for the Hudson's Bay Company. For a year and a half in the *Malacca* he sailed the Indian Seas. At that time Hong-Kong and Singapore were in their infancy, while the gates of Canton were shortly to be opened. Returning home, Dr. Helmcken met Mr. Barclay, Secretary of the Hudson's Bay Company, who gave him an appointment as clerk and colonial surgeon in the Company's service and in the process of time he was promoted to a chief-tradership in the service. A few weeks after his arrival the Doctor was sent to Fort Rupert as medical officer and almost immediately he became identified with public affairs. In writing to the colonial secretary his record of Dr. Helmcken's appointment to Fort Rupert, Governor Blanshard refers to the Indians there as "numerous, savage and dangerous," and considered that Helmcken would be more likely to be impartial in his judgment than a representative of the Company.

In 1850, following the massacre of three British subjects by the natives, Blanshard writes Earl Grey an account of the trouble and informs him that Helmcken has tendered his resignation as magistrate, as, without proper support, the office merely exposes him to contempt and insult, and he further states that being in the employ of the Hudson's Bay Company he cannot conscientiously decide the cases which occurred, which were almost invariably between the Company and its servants.

Soon after this, Dr. Helmcken was called to Victoria to attend Governor Blanshard, Dr. Benson, his predecessor, having been transferred to Fort Vancouver. He returned in a canoe paddled by Indians—a wild lot. For two hundred miles or more down the coast the party had to run the gauntlet of hostile red men, and were all of the time in considerable danger. Arriving in Victoria at the end of December, Dr. Helmcken found Governor Blanshard by this time recovered from his illness, and ever since that period, from the building of the first house to the time of his death, Dr. Helmcken maintained his residence in Victoria.

In 1856 the Colony had its first election, and on July 22, 1856, Dr. Helmcken was chosen as one of the representatives of Esquimalt. At the opening of the first House Assembly, as the parliament of Vancouver Island was called, he was elected Speaker.

The discovery of gold on the lower Fraser, 1858, was a determining factor in bringing about the formation of the Colony of British Columbia. Thirty thousand Argonauts booked passage from San Francisco and the sleepy little village of Victoria was, overnight, transformed into a busy bustling town. Many others came overland from the south and from the east, and altogether it is estimated that over thirty-five thousand men arrived that year in British Columbia, all bound for the new gold fields, New problems faced the Government. Law and order had to be preserved, and altogether the situation caused considerable anxiety in the mind of Douglas. He recommended that the mainland be made into a colony, which advice was approved of and carried out by order of the colonial office, taking effect on July 22, 1858. On that date Queen Victoria chose the name of the new colony, British Columbia, although up to that time the mainland had previously been described as a "Department of the Columbia" by the Hudson's Bay Company, and again as "New Caledonia".

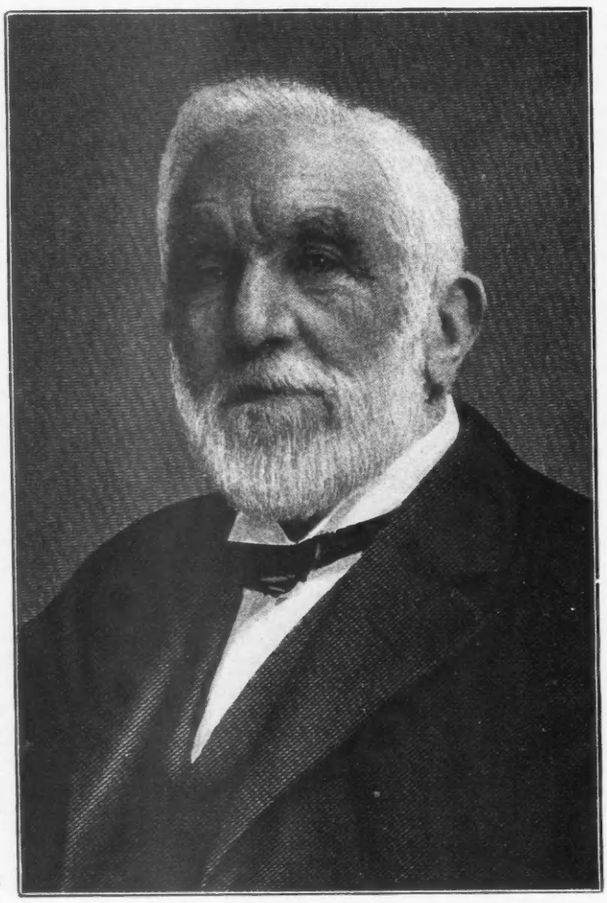
The Royal Engineers arrived in Esquimalt in the spring of 1859 on the ship *Thames City.* They came in three sections, the third and largest arriving at Victoria in April, 1859. From thence they proceeded to the mainland, following the first two sections which already were making preparations for the laying out of the Capital of the new colony. With the third section came Staff-Assistant-Surgeon J. B. Seddall, who was the first resident medical man on the mainland of British Columbia. Her Majesty, also, although at a later date, gave the name of "New Westminster" to the Capital of the colony.

From 1858 until 1863 the dual position of Governor of both colonies was held by Douglas. In September, 1863, when the commission of Douglas lapsed, the colonial office seized the opportunity to separate the administration of the two colonies. In June of that year the Duke of Newcastle instructed Douglas in an order-in-council, passed the same month, to arrange for the calling into existence of a legislative council for the colony of British Columbia. The first legislative council of

British Columbia met in the city of New Westminster, January, 1864.

Governor Kennedy was appointed in 1864 to succeed Douglas as Governor for Vancouver Island. In the colony of British Columbia, Sir James was followed by Fred. Seymour, formerly Governor of British Honduras.

In January, 1865, the Vancouver Island House of Assembly moved a resolution favouring annexation to British Columbia. This proposal appears to have been strongly opposed by Governor Seymour. Petitions for and against were circulated in both colonies, but finally the Secretary of State for the Colonies settled the question by carrying through parliament the Union Act of 1866, by the terms of which Vancouver Island was "annexed" to British Columbia. The Act was proclaimed at Victoria and New Westminster, November 17th, 1866, and Governor Seymour undertook the administration of the united colonies. The meeting of the House of Assembly of the combined colonies met in New Westminster until 1868, when, after a prolonged controversy, Victoria was selected as the permanent capital of British Columbia.



J. S. Helmcken

In the stirring events of these days, Dr. Helmcken played a conspicuous part. In addition to attending to his duties as Hudson's Bay Company surgeon, he filled the office of Coroner, Health Officer, etc., and it was said of him that he was the leading physician from San Francisco to the north pole and from Asia to the Red River. He used to put up the medicines for the patients of the Hudson's Bay Company's trading posts up the coast and in the interior, and he wittily referred to these as so many purges, so many dozen pukes, and so many dozen of quinine and calomel, etc.

The first Legislatures of Vancouver Island met in the Batchelor's Hall of the old Fort, 1856. There was no clerk, and much writing to be done, and so, as Speaker, Helmcken had much work to do. He retained his office until the union of the colonies, 1866. Following the meeting of the first assembly in Sapperton, the same year, Dr. Helmcken was appointed a member of the Executive Council. It was he who moved the resolution that the seat of Government be at Victoria. Two years later, this was an accomplished fact.

Agitation concerning confederation with the Dominion now arose. Helmcken was active with other members of the council in formulating the terms of confederation, and when these were approved by the Legislature, he, with Mr. Trutch and Dr. Carrall, were appointed as delegates to carry the terms to Ottawa, where they were, in substance, agreed to.

Following confederation in 1871, Dr. Helmcken was offered a senatorship but declined, preferring to take care of his family and his medical practice. Dr. Robert W. W. Carrall, of the Cariboo, one of the delegates, was appointed senator and Mr. Trutch became the first Governor of the Province.

Hon. J. S. Helmcken was appointed first president of the British Columbia Medical Association, January 15, 1885, and his son Dr. James Douglas Helmcken was elected secretary-treasurer at the same meeting.

Dr. Helmcken was married, December 27, 1852, to Miss Cecilia Douglas, daughter of the Governor. As there was no church, the ceremony was performed in the mess room of the Fort by the Rev. Mr. Staines, chaplain of the Company.

The writer had the pleasure of meeting Dr. J. S. Helmcken in Victoria in 1912 and knew his son, Dr. "Jim", as he was called in Victoria. For some years before his death Dr. J. S. Helmcken lived with his daughter, Edith Louisa Higgins, a widow. His end came peacefully on September 1, 1920. Facing the main entrance of St. Paul's, one of the major hospitals of Vancouver, is the western terminus of "Helmcken Street", which, stretching eastward, crosses Granville Street, one of the main

arteries of the city. In this manner is the name of British Columbia's pioneer physician commemorated there.

THE GOLD RUSH OF 1858

The discovery of gold on the Fraser, in 1858, gave the impetus that transformed Victoria from a sleepy little backwoods trading post into a populous rendezvous. At first there was a marked inclination on the part of the American miners and adventurers coming from San Francisco to give preference to the American ports on Puget Sound. Port Townsend was, for a short time, a favourite place of debarkation; then Whatcom on Bellingham Bay and lastly, Semiahmoo, just south of the international boundary, each being "boosted" in turn by the California press. Finally, the impatient and sorely tried miners, who had been lured to Whatcom, Port Townsend and other points, realized that they had been tricked by their unscrupulous compatriots.

When the bubble burst, and the Bellingham Bay Trail became a byword and a reproach, it was then that Victoria—at first shunned by American citizens, or at least by a great number of them—came to be generally recognized as the one and proper place of departure for the Fraser River. A city of canvass sprang up on the shores of James Bay. The population increased by hundreds over night, and although, in the cosmopolitan throng, there were many turbulent spirits and pure adventurers they were, generally, well behaved.

Alfred Waddington, one of the outstanding men of this period in British Columbia, describes the heterogeneous peoples arriving in the colony as "The outpourings of a population containing, like that of California, the outscourings of the world" but he qualifies this harsh criticism with the remark "Let it be said here, to the credit of the town of Victoria, that some of the worst of these characters kept away." He is careful to add:

"Mixed up among all these, however, was a large body of responsible emigrants, patient, hardworking miners, and others; honest men who had come to live here by their industry, hoping to assist their families and better their position; quiet law-abiding citizens, if ever there were. Many of these have been sadly disappointed, whilst others, more successful, have remained here and form a considerable proportion of our present population, as exemplary a one as is to be met with." As a matter of fact, the men of 1858 were western pioneers of a fine type. Naturally, there was a small residue of disreputable element, but these were soon eliminated. The early history of no settlement, launched in such peculiar and trying circumstances, is so free from crime as the early history of British Columbia, and that, in itself, shows the high calibre of the men who first came to the land.

THE MEDICAL MEN OF 1858 TO 1878

Among the number of strong and able pioneers who achieved distinction in one way or another in their adopted country were several medical men, who, during the two decades 1858 to 1878, rendered signal service to their communities in various positions of trust, and also as members of the Legislative Assemblies of the Colonies of Vancouver Island and British Columbia, of the Legislature of British Columbia, in the House of Commons and Senate of Canada.

Dr. James Trimble, a native of Ireland, sat in the old Vancouver Island Assembly in 1859, representing Victoria. Later he represented the same city in the Legislature of British Columbia, 1871-76, during which time he was Speaker. He was a strong advocate of union with the Dominion in the days preceding the days of the entry of British Columbia into Confederation. He died on January 1, 1885, at Victoria. His name is commemorated in Vancouver in Trimble Street, West Point Grey.

Dr. John Kennedy, a retired officer of the Hudson's Bay Company, represented Nanaimo in the Assembly of 1859.

Dr. Israel W. Powell arrived in Victoria in April, 1862, *via* Panama and San Francisco, to engage in the practice of his profession. He was born at Simcoe, Lake Erie, Ontario, April 27, 1837, and after a liberal academical training, graduated in medicine at McGill University, Montreal. He belonged to an old United Empire Loyalist family, one of whose ancestors, Thomas Powell, settled on Long Island, 1645, and many of whose representatives had been prominent in eastern Canada. Soon after establishing his residence in Victoria we find him taking a prominent part in the affairs of the city and of the colony. Elected to the old Legislative Assembly of Vancouver Island, he was a member of that body from September, 1863, to August, 1866. It was during the Session of 1865 that he introduced and carried the law establishing the first system of free public schools in British Columbia and was the first president of the Board of Education.

Dr. Powell was a strong advocate of the union of the Colonies which took place in 1866, and subsequently was a leader on the Island of Vancouver in the agitation for Confederation, making the first public speech in its behalf. Public feeling in Victoria was strongly opposed to union with Canada, and he, therefore, was on the unpopular side; so much so, that he lost his election as a candidate for the Legislative Assembly in 1866 in consequence of his championship of the cause. After 1871 the efforts Dr. Powell had made on behalf of

Confederation and his standing in the community were recognized by Sir John A. Macdonald who offered him a Senatorship. This, owing to the time involved and consequent neglect of private interests, he could not afford to accept, but, in 1872, at the request of the Canadian Premier, he became superintendent of Indian Affairs in the province, in which capacity he remained until 1890.

Dr. Powell played a prominent rôle in promoting the Medical Act which became law in 1886, and was elected first president of the Medical Council of British Columbia. He took an initiative part in inducing the Canadian Pacific Railway to extend its line through Port Moody to Granville, now Vancouver City, making the latter its real terminus, and, with others, he did much to further the development of Vancouver as an urban centre. In a sense, therefore, Dr. Powell may be said to have been one of the fathers of Vancouver, a child of which any foster parent might well be proud. An important thoroughfare in Vancouver, Powell Street, is named after him.

In 1862 there arrived in Victoria from England Dr. John Chapman Davie, who, with several members of his family, was destined to become noted in the affairs of the province. Of his several sons, Dr. John Chapman Davie, Jr., became one of the foremost surgeons on the Pacific Coast; Alexander was Premier of the province when death removed him; Theodore had been Premier and was Chief-Justice at the time of his death.

Dr. John Chapman Davie, Sr., was a member of the British Columbia Legislature in the late 'sixties, and, in partnership with his son, carried on medical practice in Victoria until his death about the mid-seventies.

Dr. John Chapman Davie, Jr., or Dr. J. C. Davie, as he was known after the death of his father, achieved the distinction of becoming the most outstanding surgeon in British Columbia for more than three decades, and not until ill health called a halt upon his activities did he give place to others. As the most prominent surgeon of his day in British Columbia, a more extended and comprehensive account of his life and work will follow in a later chapter.

In these early days of the "sixties" in Victoria, in addition to the medical men already referred to, we find the names of Dr. James Dickson, Dr. Haggin, and Dr. John Ash, all listed in 1865, with Dr. J. C. Davie, Sr., Dr. James Trimble, and Dr. I. W. Powell, as medical attendants to the Royal Hospital at Victoria.

Dr. John Ash, was, in the early "seventies," a member of the Legislature of British Columbia, and was Provincial Secretary, 1872-74, in the Government of Mr. Amor de Cosmos.

On the mainland, as will be noted later under the caption of "Early Colonial Hospitals", Staff-Surgeon Seddall, who arrived with the Royal Engineers in New Westminster, 1859, was the first resident medical man to practise his profession there. He also established the first hospital on the mainland at New Westminster, and when he departed for England in 1863, his term of service with the Engineers having expired, the hospital was turned over to the people of New Westminster and became the Royal Columbian.

Dr. Oliver, 1860-66, is mentioned as one of the early physicians of New Westminster.

Dr. A. W. S. Black, 1862-71, probably one of the best known physicians of New Westminister in the "sixties", was elected to the first Legislative Assembly of the Colony of British Columbia in 1863, representing Cariboo West, and on January 13, 1864, when it met in New Westminster, among the members of council was the Honourable A. W. S. Black. He was an ardent supporter of union with Canada, and in 1868 we find him attending the Yale Convention, where representatives from the various parts of the Colony had gathered to discuss this important question.

Arthur Walter Shaw Black was born at Bo'ness, formerly called Boroughstoneness, a small town sixteen miles from Edinburgh. After receiving his medical degree, he served in the Crimean War as a surgeon, and later went to Australia, arriving in British Columbia, *via* San Francisco, in 1862.

On the head stone over his grave in New Westminster is the following inscription:

> Sacred to the memory of A. W. S. Black, M.D.,
> Born at Bo'ness, Scotland,
> age 38
> He was killed on the night of the 26th of March 1871,
> by a fall from his horse while hastening to fill his
> professional duties.
> Erected to the late Dr. Black by his friends
> in British Columbia.

The place of the accident was about midway between New Westminster and Granville, on the old Douglas Road which connects New Westminster and Granville (now Vancouver). For a number of years there was a sign indicating the place where he fell.

A record of the medical men of this period in New Westminster would be incomplete without due mention of Dr. Brouse, 1862. It is noted that he attended the Yale Convention in 1868, and practised his profession there. A son was born at Yale and he later became a doctor—a graduate of McGill and practised in New Denver, British Columbia, in the late "nineties". He came to Vancouver after the war, limiting his practice to skin diseases, and died in Vancouver a few years ago. A son of the latter is also a graduate in medicine of McGill and was house surgeon in the Vancouver General Hospital half a dozen or more

years ago, and is now practising in Saskatchewan.

Dr. W. H. McNaughton Jones was a resident of New Westminster in 1866, and later removed to Vancouver Island, where he practised his profession at Nanaimo and Victoria, and, later, up to the time of his death, at the Quarantine Station at Williams Head.

The all important question before the British Columbia Legislature in 1870 was the consideration of the "Terms of Union", as proposed by Governor Anthony Musgrave. After two weeks' debate, ending March 25th, the resolutions were adopted and the task of negotiating the "Terms of Union" with the Dominion authorities was entrusted to the Hon. J. S. Helmcken, Mr. Joseph W. Trutch and Dr. Robert W. W. Carrall. On July 7, 1870, the terms were agreed upon, the Dominion accepting, almost in their entirety, British Columbia's proposals. The most important clause in the treaty between Canada and British Columbia, known as the "Terms of Union", provided for the construction of a railway to connect the seaboard of British Columbia with the railway system of Canada.

The terms, as agreed upon, were ratified by the electorate in the fall of 1870, and the Crown Colony of British Columbia became the Province of British Columbia in the Dominion of Canada, July 20, 1871.

It is interesting to note that the Government of Sir John A. Macdonald, in appointing the Senators for British Columbia, offered these positions, three in all, to Honourable Dr. J. S. Helmcken, Dr. I. W. Powell, and Dr. Robert W. W. Carrall. The first two declined the honour on account of personal reasons and practically dropped out of public life from that date on, devoting their time to their private interests. Dr. Robert William Weit Carrall, member for Cariboo in the Provincial Legislature, 1869, accepted the Senatorship offered him and represented British Columbia in that august body for a number of years.

Dr. Carrall, a big, powerful-looking man, was a fair speaker, though declamatory in style, and, for a time at least, a social favourite at Ottawa. He was one of the strongest advocates of Confederation and assisted materially in negotiating the "Terms of Union." Across the busiest part of downtown Vancouver, stretching from north to south, across the peninsular portion upon which the business section is built, is a short but important thoroughfare — Carrall Street. In this manner has Vancouver commemorated the name of the first medical Senator from British Columbia.

(To be continued)

Association Notes

THE CANADIAN MEDICAL ASSOCIATION

MILITARY SECTION

One of the outstanding features of the last annual meeting of the Association, held in Vancouver, was the inauguration of a Military Section. This section held one session and was very largely attended. The inaugural address, delivered by Col. J. T. Clarke, D.G.M.S., Ottawa, was an important pronouncement and contained some practical suggestions which should be listened to, as they would be very pertinent in the event of another World War. Col. Clarke's address was discussed at a Round Table Conference. His remarks follow.

"I appreciate most sincerely the privilege of being allowed to assist in the making of history for this august Canadian Medical Association, by the inauguration to-day of a Military Section. The Executive of the Canadian Medical Association received, last autumn, a petition signed by some of its most distinguished members from the Atlantic to the Pacific, and who are also members of the Canadian Army Medical Corps, asking for the formation of this Section, and giving certain reasons which appeared to convince the Executive, so the necessary action was promptly taken, and now the responsibility rests with the military members to make it successful.

"Many ways will suggest themselves to the members for bringing this about. A resolution of the Canadian Medical Association, recommending certain procedures to the Department of Defence, is bound to carry great weight, and to receive most careful consideration, as, in case of a mobilization of the Canadian Forces, we would have to depend on the Canadian Medical Association for not only our ordinary medical officers but also our specialists and consultants. Therefore, if your experience shows you that, under existing regulations, there is a condition which works to the disadvantage of either the profession or the public, this might be made the subject of a resolution, which, if passed after due discussion, could be forwarded to the Executive, or to the whole assembly, for further action in taking up the matter with the Department of Defence.

"For example, when mobilization was ordered in 1914, the members of the medical profession flocked to the colours, as they have always done in the past, and will always do in the future. They were taken on as fast as they offered, until our requirements (including specialists) were satisfied. This was all right for the Department, and we obtained a lot of most excellent medical officers. It was found, however, that certain hospitals had been denuded of their pathologists, or their surgeons,

or their radiologists, etc., and also that certain whole towns and cities had been similarly denuded. This state of affairs could be easily prevented in a future mobilization, by having a control plan worked out by this Section, and forwarded to Defence Headquarters for consideration. The plan, when approved, would be pigeon-holed at Headquarters, ready to become operative as soon as mobilization is ordered. The Control Plan would function somewhat as follows. In accordance with its provisions, instructions would be sent to the Officer in Command of each District to appoint a distinguished and influential local member of the profession to act with the District Medical Officer, the two to have full power as to the selection of officers for service from those who apply. In this way the needs of both the army and the general public could be looked after.

"Another way in which this Section will be able to function for the good of the general public is, to induce the Executive to take the necessary steps to encourage all of the members of the Canadian Medical Association to make themselves acquainted in peace time with all the books and literature which are issued by the War Office dealing with chemical warfare and bacteriological warfare, thus enabling them to become instructors of the public as soon as there is a state of war. Somebody must, in this event, teach the people in a hurry how to improvise gas respirators, and protective clothing, how to do the decontamination of clothing, articles, and areas which have been splashed by the gas, how to give first aid to those who have been exposed, and what materials should be kept on hand for those purposes. The struggle in the next war will not be confined to the areas where the troops are concentrated, but aeroplanes will carry the offensive directly to the home cities which supply the re-inforcements, and the factory areas which supply the equipment for war. It may be news to some of you that, for the last eighteen months, an important scientific European country has been experimenting, with very marked results, in the explosion, by wireless, of gas bombs, even in large quantities. The *modus operandi* would be something as follows. A large fleet of bomb carriers would be loaded with a huge quantity of these bombs, and would fly at a great altitude, in order to get over its objective without being seen or heard. They could, however, see their objective through their powerful glasses. They would be accompanied by a plane fitted up with the "touching off" wireless apparatus. When in the desired position the bombs would be released, and would be carried gently down to all parts of the city, the speed being checked by a sort of paraehute apparatus. Then, when they were well settled to earth, they would be all exploded simultaneously. Those of you who know the deadly effect of mustard gas can appreciate the tragic results to the chosen city. I hope I have made clear the need for medical men to make themselves acquainted in peace time, with enough information as to chemical warfare, to qualify themselves as instructors of the general public. I am not, at this time, stressing the matter of bacteriological warfare, as one would think it impossible for any nation that exists to-day, to take up that form of warfare. However, the possibility is there, and it is well to keep it in mind.

"Many other openings for recommendations to Defence Headquarters will suggest themselves as time goes on, and it might even be possible to start something for the benefit of the profession as well as for the public and the Department of Defence, as those of you who served through the last war can remember that you served under some certain conditions which might stand a little improvement in order to bring our service on a par with that of Great Britain and some of our allies.

"Of course, in one way, this discussion appears to be a waste of breath and energy, for we find plenty of well posted and brainy people, both men and women, who assure us, with the greatest candour, that the League of Nations, the Kellogg Pact, and the various Disarmament Conferences have made it absolutely impossible for another war, with all its horrors, to break out. However, in spite of these well meant assurances, it appears that the majority of the hard-headed citizens of the world are inclined to institute precautions, and take no chances.

"In this connection it might be well to point out that, under present conditions, if two nations did come to blows it is hard to understand how any nation can keep out of it, and still keep the solemn agreement entered into in the League of Nations and the Kellogg Pact. At the time of the Russo-Japanese War it was quite possible for other nations to sit back and watch them settle their differences, and this was done, but, if such a thing occurred to-day, none of the signatories of the League of Nations could keep out of it, as they are all bound by solemn agreement to crush the aggressor, and the Kellogg Pact would also bring in our neighbours to the south. The trouble would be to decide as to which was the aggressor nation, as it is not likely that either side would admit it. We fought all through the Great War with each side declaring most emphatically that the other was the aggressor, and both sides attracted many adherents, but these adherents appeared to line up, not so much on account of the justice of the cause, but on account of their own private interests. It is safe to predict that the same influences of

self-interest and self-preservation will be brought to bear in deciding which side to take when that next fight starts, and, as no nation can keep out of it, not even Canada with her new "status", it promises to be a merry old war.

"I hope, at any rate, I have shown a couple of examples of how this Section may function for the benefit of both the public and the Department of Defence. It may also be possible to devise some way for it to produce some benefit to the members of the profession, but that will be a matter for later consideration.

"It might be argued that a recommendation from this Association might not carry very great weight at Defence Headquarters, but, apart from the large number of influential citizens who would be behind such Resolutions, we might pause to consider some of the things which the army owes to the medical profession, such as—

First. Cutting down disease in the army to such an extent that, whereas in former wars 9 soldiers were killed by disease to every one killed by battle; in this last war 16 were killed by battle for every 1 killed by disease.

Secondly. In the Great War, because of inoculation, and various hygienic preventive procedures, the incidence of disease was actually less than in peace times.

Thirdly. Wound infection was so well conquered that, of the wounded who survived 6 hours 90 per cent recovered; of the wounded who reached a field hospital 95 per cent recovered; and of the wounded who reached a base hospital 98 per cent recovered. Barely 2 per cent of the wounded became crippled or permanently completely disabled.

Fourthly. During the Great War the various British hospitals did such wonderful work for the army that they were able to send back to duty, in various categories, the enormous number of 4,862,089 who had been admitted to hospital for sickness or wounds. That means that the Medical Services actually recruited for the British Army nearly five million men, and they were not raw recruits, but trained men, and men who, under the old conditions, would have been lost to the service.

"You may be quite sure that Military Headquarters are quite well aware of these figures and appreciate what the medical profession can do for them, if properly organized. It is, therefore, quite apparent that Headquarters will be ready to turn a friendly ear, and to give careful consideration to any well thought-out recommendations from this Association."

Hospital Service Department Notes

APPROVAL FOR INTERNESHIP

After considerable investigation and consideration, a list of hospitals in Canada which are approved for interneship has been prepared by the committee on approval of the Department of Hospital Service of the Canadian Medical Association. Formerly this service was rendered by the Council on Medical Education and Hospitals of the American Medical Association. This list has been prepared according to the requirements of a very fair Basis of Approval and should result in the retention in Canada for their interneship of a larger number of our recent graduates. All public general hospitals with a capacity of one hundred beds or over were invited to submit an analysis of their services and interne facilities. The 26 hospitals which have been approved by the committee of approval are all excellent institutions and well able to give the interne a varied and sound clinical training.

It was found that a number of hospitals offered good interneships with wide clinical experience and opportunity, but did not meet *all* of the requirements of the Basis of Approval. For instance, in some the autopsy percentage was too low; in others the average daily census was below the minimum of seventy-five; or the medical staff was not organized as outlined in the Basis of Approval; or the services and facilities were too limited. In order to give recognition to these otherwise very acceptable hospitals, a "recommended" list has been prepared and is included in the published pamphlet. A copy of these lists may be obtained on application at 184 College Street, Toronto 2.

MEETING OF THE NEW BRUNSWICK HOSPITAL WORKERS

The third meeting of this Association, held in Newcastle this year, showed a definite increase in attendance, and the program arranged by Mr. G. P. Burchill, of Newcastle, proved most interesting. Many timely subjects were discussed. It was decided to appoint a committee to study with the provincial government the whole system of financial assistance to hospitals; also to consider a possible basis of union whereby the three maritime provinces could unite in a Maritime Hospital Association. In all probability some effort will be made in the future to improve hospital legislation in this province. Among the outstanding contributions were papers and addresses by Dr. L. G. Pinault, of Campbellton; Sister Kenny, of Chatham; Major A. C. Galbraith, of Toronto; Dr. R. J. Collins, of Saint John, Hon. Dr. H. I.

Taylor, of Fredericton, and Miss H. E. Hivey and Mrs. Stables, of Newcastle. At the public session in the evening addresses were given by Dr. J. B. McKenzie, of Loggieville, and Dr. Harvey Agnew.

Mr. A. C. Chapman, of Moncton, was elected *President*, to succeed Mr. J. A. Reid the charter president, and Lt.-Col. T. G. Loggie, of Fredericton, was re-elected *Secretary-Treasurer*.

THE ONTARIO CONFERENCE OF THE CATHOLIC HOSPITAL ASSOCIATION

Another association has been recently added to the group of hospital organizations in Canada. At a recent meeting in Toronto, the Ontario Conference of the Catholic Hospital Association, which has been under consideration for some time, was organized. All of the hospitals in Ontario which are operated by the Sisters will be eligible for membership. It is not considered that this new organization will detract in any way from the interest taken by these hospitals in the Ontario Hospital Association. We understand that, whenever possible, the dates of the two conventions will be approximated to permit one meeting to immediately follow the other. One of the first acts of this new association at the organization meeting, which was attended by His Grace, the Archbishop of Toronto, the Most Reverend N. McNeil, and by Reverend Alphonse Schwitalla, S.J., of St. Louis, the President of the Catholic Hospital Association, was to apply for membership in the Canadian Hospital Council.

The officers are Sister Madeleine de Jésus, Ottawa General Hospital, *President;* Sister Mary Doherty, General Hospital, Sault Ste. Marie, *Vice-President;* Sister M. Margaret, St. Michael's Hospital, Toronto, *Secretary-Treasurer*. The delegates to the Canadian Hospital Council are Rev. Wilfred Smith, Chaplain, St. Michael's Hospital, Toronto, and Sister St. Elizabeth, St. Joseph's Hospital, London.

Provincial Association Notes

A STUDY OF MEDICAL SERVICES BY THE ONTARIO MEDICAL ASSOCIATION

During the past year the Board of Directors of the Ontario Medical Association has had under consideration the economic side of the practice of medicine in the Province and an attempt has been made to collect definite information on the subject. In four of the districts, a form of questionnaire has been submitted to all practitioners and a summary has been prepared from the answers received, as follows, the percentage of replies being quite as great as experience with this form of investigation leads one to anticipate:—

	Dist. 4	*Dist. 5B*	*Dist. 6*	*Dist. 7*
1. What do you estimate as the cost of your medical education?	$22,855	$23,887.17	$18,124.74	$20,031.12
2. What do you estimate as the cost of carrying on your practice per year?	2,750	2,764.40	3,924.96	2,253.89
3. What is your yearly income from medical practice? (Average over 5 years if possible)	5,576	7,005.62	6,390.99	6,286.15
4. What is the total yearly amount charged at ordinary rates?	8,915	8,588.61	5,144.24	7,776.15
5. What do you estimate as the amount of work in a year you do for which no charge is made?	1,684	2,738.90	1,246.75	1,600.12
6. What amount yearly are you unable to collect for work done and charged at ordinary rates?	1,835	1,967.03	814.82	1,354.05
7. What do you estimate that it costs the ordinary family per year in your community for medical care?	62	66.50	45.29	50.92

As District No. 4 includes the Niagara Peninsula, No. 5B the metropolitan area of Toronto, No. 6 the Peterborough district, and No. 7 the Kingston district, the results may be considered fairly representative of the conditions existing in older Ontario, including as they do, city, town and country areas of varying conditions of density and wealth of population. It is interesting to note that there is no wide variation in either the amount of annual income, the cost of carrying on practice or the average cost of medical services per family; the cost of medical education is understood to include college and post-graduate outlay, together with the loss presumably incurred in pursuing a prolonged college course rather than entering a gainful occupation at the average age, and the amount necessarily deducted from income for the amortization of this and other capital outlay during earning years. All this makes the income of the average medical man in Ontario by no means enviable.

In the last analysis this is the basis on which the cost to the public of medical service must be assessed, and the finding of the Committee, agreeing, in general, as it does with the result of investigations carried on in the United States, merits the serious consideration of all students of this aspect of our social problems.

ONTARIO MEDICAL ASSOCIATION

ANNUAL MEETING, DISTRICT NUMBER THREE

District Number Three of the Ontario Medical Association met at Owen Sound on October 8th. Due to the very regrettable illness of the District Counsellor, Dr. Richard Howey, of Owen Sound, the meeting was presided over by Dr. Francis Moore, of Clarksburg, the Vice-counsellor of the District.

During the afternoon, an excellent program was given, as follows:—

Dr. D. A. Volume, of Southampton, was the first speaker, his subject being "Medical economics," after which Dr. Geo. S. Young, of Toronto, gave an address on "Differential diagnosis of pain in the back." Dr. H. W. Wookey, of Toronto, then gave a talk on "Some of the uses of radium in surgery."

Dr. W. J. Bell, Deputy Minister of Health of the Province of Ontario, was present and, in a brief talk, stressed a number of matters which are of mutual interest to the medical profession of the Province and to the Department of Health.

The next speaker during the afternoon was Dr. W. B. Hendry, of Toronto, his subject being, "Some clinical problems in pregnancy and childbirth."

During the afternoon, the ladies assembled at the home of Mrs. T. H. Middlebro and enjoyed a game of bridge followed by afternoon tea. At 6.15 p.m. both ladies and gentlemen attended the banquet given at the Masonic Hall, after which brief addresses were given by Dr. L. J. Austin, and Dr. T. C. Routley, President and Secretary, respectively, of the Ontario Medical Association.

At the business session, Dr. Richard Howey was nominated as *Counsellor* for another year, and Dr. Francis Moore, of Clarksburg, and Dr. T. H. Sneath, of Durham, were elected *Vice-Counsellors*.

The attendance, unfortunately, was not so good as in previous years, but the thirty-two doctors who were there thoroughly enjoyed the meeting.

ANNUAL MEETING, DISTRICT NUMBER FOUR

The annual meeting of District Number Four of the Ontario Medical Association was held at the General Hospital, St. Catharines, on October 9th, 1931, in conjunction with the Clinical Day of the Lincoln County Medical Association.

Dr. George C. Hale, of London, took charge of the clinics in Medicine, and during the morning session reviewed several cases of cardiac disease and leukæmia. During the afternoon he spent a good portion of his time on the subject of arthritis.

Dr. R. I. Harris, of Toronto, took care of the surgical cases, and clinics were given on the subject of varicose veins, osteomyelitis and septic arthritis, as well as abdominal conditions, post-operative cases of appendicectomy and cholecystectomy being presented.

Luncheon was served by the Ladies' Aid of the St. Catharines General Hospital, and was presided over by Counsellor Dr. W. K. Colbeck of Welland. After-luncheon speakers were Dr. W. J. Bell, of the Department of Health, and Dr. T. C. Routley. Dr. Bell spoke on "Our mutual interests" and Dr. Routley gave an illuminating talk on medical conditions throughout Canada. During the luncheon, Dr. Colbeck was nominated *District Counsellor* for the ensuing year, and Dr. P. B. MacFarlane, of Hamilton, was elected *Vice-counsellor*.

Following the afternoon clinical session an organized trip was made to the flight locks on the Welland Ship Canal, where an engineer was present to explain the details of operation. There was also an organized visit to the Niagara Peninsula Sanatorium.

The evening meeting was held at the Welland House, where dinner was served to 84 men. Dr. A. Primrose, of Toronto, gave a very enlightening lecture on the "Cancer problem." This was followed by an interesting talk on the "Kings of France" by Dr. L. J. Austin, of Kingston, President of the Ontario Medical Association.

The total number of men registered during the day was 125.

ANNUAL MEETING, DISTRICT NUMBER FIVE A

On October 6th, the annual meeting of District Number Five A of the Ontario Medical Association was held in Brampton, the visiting Doctors being guests of the Peel County Medical Society.

The meeting was held in Oddfellows Hall, commencing at 2.30 p.m. when Dr. H. W. Wookey, of Toronto, gave an address on the "Uses of radium in surgery." Dr. Geo. S. Young of Toronto then gave a talk on "Differential diagnosis of pain in the back." This was followed by an address by Dr. W. J. Bell, Deputy Minister of Health of the Province of Ontario, on "Mutual interests." Dr. W. B. Hendry then spoke on "Some clinical problems in pregnancy and child-birth."

During the afternoon, the ladies enjoyed a delightful drive to points of interest in the locality, calling at the Dale Rosaries, and afterwards joining the men at a sumptuous banquet prepared by the Brampton Ladies Committee, the Boy Scouts acting as waiters. An excellent orchestra was in attendance, adding very materially to the enjoyment of the occasion. Immediately following the dinner, short addresses were given by Dr. L. J. Austin and Dr. T. C. Routley, President and Secretary, respectively, of the Ontario Medical Association.

At the short business session held during the day, Dr. Ira Freel, of Stouffville, was nominated *Counsellor* and Dr. John Graham, of Bolton, was elected *Vice-counsellor*. It was decided that the meeting next year be held in Stouffville.

The weather was perfect and the attendance

very good indeed, there being 40 doctors and 35 ladies present. The opinion was unanimous that the meeting was a great success.

ANNUAL MEETING, DISTRICT NUMBER SEVEN

The annual meeting of District Number Seven was held on November 13th, 1931, in the Amphitheatre of the Richardson Laboratory, Kingston, Ont.

Dr. H. C. Pratt, of the Ontario Hospital, Woodstock, delivered a very able address on the "Diagnosis and treatment of epilepsies." Dr. G. E. Wilson, of Toronto, in a very practical manner demonstrated his methods of diagnosis and treatment of "Some fractures of the lower extremity." Several of the members presented cases of clinical interest.

The meeting adjourned to meet again at the LaSalle Hotel at 6.30 p.m. After the annual dinner an address was given by Dr. T. C. Routley, Secretary of the Ontario Medical Association, and by Dr. W. J. Bell, Deputy Minister of Health for the Province of Ontario, who spoke on "Mutual interests." Dr. L. J. Austin, of Kingston, President of the Ontario Medical Association, brought the meeting to a close by a very happy presentation of his address on "Hogarth's Doctors."

The meeting was well attended, there being present fifty-two graduates and forty-seven students.

THE CUMBERLAND BRANCH OF THE MEDICAL SOCIETY OF NOVA SCOTIA

The annual meeting of the Cumberland Branch of the Medical Society of Nova Scotia was held at Amherst on October 27, 1931, when Dr. F. L. Hill, of Parrsboro, was elected *President* for the ensuing year, while Dr. W. T. Purdy, of Amherst, was re-elected as *Secretary*. Dr. H. E. MacDermot, of Montreal, and Dr. W. Alan Curry, of Halifax, who comprised a lecture team sent out by the Canadian Medical Association, were present, the former speaking on "Tuberculosis and asthma," and the latter on "Infections of the hand." Doctors MacDermot and Curry included several other branch Societies in their tour.

Medical Societies

THE ACADEMY OF MEDICINE, TORONTO

An event of historical importance took place at the first stated meeting of the Academy of Medicine, Toronto, on October 6, 1931, when a badge of office was presented to the President, Dr. Harris McPhedran. The donor, Dr. John Ferguson, who made the presentation, speaking in his cultured, easy style, was particularly happy in his remarks. This badge is an official decoration to be worn on all occasions when the President is in the chair. The accompanying illustration conveys an excellent impression of its appearance and size.

In the centre of the main portion of the badge is the figure of Hygeia, the Goddess of

Health, standing on the apex of the globe, In her left hand she is holding the bowl from which the sacred serpent is being fed. In her right hand is seen a scroll, the emblem of learning. Around the figure of Hygeia is an inverted horseshoe, on which are the words "Academy of Medicine, Toronto." Surrounding the medallion is a wreath of laurel leaves, the symbol of honour and achievement. At the upper part are the words "Praesidis Insigne." On the globe is the date of the foundation of the Academy. At the bottom, the two portions of the laurel wreath are fastened by a lover's knot.

The second important part of the badge is the crest of the Academy. In the centre of this part is the open book representing the library. Above the open book is the cruse to give light, and beneath the book are the expressive words "Domina rerum sapientia". The crest of the Academy and the medallion are joined by suitable links of neat design. From the crest there extends on each side a series of oblong links and maple leaves. From these there passes around the neck of the wearer a ribbon of old gold colour.

The metal portions are made of the usual gold standard, employed both for durability and appearance. The design was prepared by Dr. John Ferguson, and the workmanship is by the firm of Ellis Brothers, of Toronto.

This is another example of the ready generosity of the donor who only a short time ago made a similar gift to the Canadian Medical Association.

THE CORNWALL MEDICAL SOCIETY

The following officers have recently been elected by the Cornwall Medical Society:— *President,* Dr. J. A. Tallon; *Vice-president,* Dr. H. J. Mack; *Secretary-treasurer,* Dr. J. A. McGuire.

THE EDMONTON ACADEMY OF MEDICINE

The election of officers for the year 1932 at the December meeting of the Academy resulted as follows: *President,* Dr. J. G. Young; *First Vice-president,* Dr. H. Orr; *Second Vice-president,* Dr. F. Gillespie; *Secretary,* Dr. H. Vango; *Treasurer,* Dr. H. K. Groff; *Executive Committee,* Drs. I. W. T. McEachern, M. Levey, and F. Macpherson.

THE HURON COUNTY MEDICAL SOCIETY

The following officers have been elected by the Huron County Medical Society for the year 1932:— *President,* Dr. A. H. Macklin, Goderich; *Vice-president,* Dr. A. J. MacKinnon, Zurich; *Secretary-treasurer,* Dr. Percival Hearn, Clinton.

At the annual meeting of the Society, an address was delivered by Dr. J. H. Holbrook, of the Mountain Sanatorium, Hamilton, on the "Prevention of cavity formation in pulmonary tuberculosis, and the methods used in the obliteration of cavities already formed. Following this a four-reel moving picture was exhibited, demonstrating the surgical treatment of peptic ulcers.

THE LANARK COUNTY MEDICAL SOCIETY

At the last meeting of the Lanark County Medical Society, the following officers were elected for next year:— *Honorary president,* Dr. W. W. Buttle, Pakenham; *President,* Dr. A. Downing, Carleton Place; *Vice-president,* Dr. A. W. Dwyre, Perth; *Secretary-treasurer,* Dr. R. M. Ferguson, Smiths Falls; *Executive Committee,* Dr. R. J. Walker, Smiths Falls; Dr. J. F. Dunn, Almonte; Dr. H. C. Hagyard, Perth.

THE MIDDLESEX MEDICAL ASSOCIATION

The meeting of the Middlex Medical Association was held at the Ontario Hospital November 12th, on the invitation of Dr. F. S. Vrooman, Medical Superintendent. The following papers were read: "Consideration of the symptoms of manic depressive disease," and presentation of cases, by Dr. D. O. Lynch, and "The presentation of typical cases of schizophrenia," by Dr. F. S. Vrooman. Addresses were given by Dr. George Ramsay, Counsellor for the District, and by Dr. E. S. Davis, Representative on the Canadian Psychiatric Society, Ontario.

The following officers were elected:—*President,* Dr. C. H. McDougall, Strathroy; *First Vice-president,* Dr. H. C. Fletcher, Arva; *Second Vice-president,* Dr. H. G. Pink, Deleware; *Secretary-treasurer,* Dr. W. H. Woods, Mt. Brydges.

The Association has a larger membership this year than it has had for many years, 25 members, 3 life members and 3 honorary members.

THE NORTHERN MANITOBA MEDICAL ASSOCIATION

At a meeting of the Northern Manitoba Medical Association on October 8, 1931, the following officers were elected:— *President,* Dr. J. R. Gunne; *Vice-president,* Dr. G. W. Rogers; *Secretary,* Dr. R. E. Dicks; *Representative to Manitoba Medical Association,* Dr. G. D. Shortreed.

THE NORTHWESTERN MEDICAL ASSOCIATION

The Northwestern Medical Association has had a very successful year. A special meeting on October 9, 1931, was the 70th meeting since its organization several years ago under the leadership of Dr. M. C. O'Brien, now of Frontier, Sask. Meetings have been held at Hamiota, Shoal Lake, Russell, Virden and Miniota, with an average attendance of 18.4. Many outside speakers have attended. The *President* of the Association is Dr. A. V. Jubb, McAuley; and the *Secretary*, Dr. R. F. Yule, Kenton.

THE ONTARIO COUNTY MEDICAL SOCIETY

The following officers have been elected by the Ontario County Medical Society:— *President*, Dr. C. O. Miller, Oshawa; *Secretary*, Dr. O. G. Mills, Oshawa.

THE REGINA AND DISTRICT MEDICAL SOCIETY

The annual meeting of the Regina and District Medical Society was held on November 18th after a dinner at the Parliament Buildings. The guest of honour was Hon. H. E. Munroe, Lieutenant-Governor of the Province of Saskatchewan, who was made an honorary life member of the society. Dr. Harvie, in introducing Dr. Munroe, recalled the war association of many of the members with Col. Munroe, when he was in command of the Saskatchewan Unit. Dr. Munroe in a very happy speech of acceptance of honorary membership, favoured his listeners with some extracts from Ravel's Diary written in 1847. The writer describes one of the early operations for stone with the use of chloroform; to the layman of that day some of the customs of medical etiquette were almost as hard to understand as they are to-day.

The scientific program included short papers on "Recent advances in medicine" by Dr. E. K. Sauer. The work in isolating the virus of disseminated sclerosis, the treatment of epilepsy by the ketogenic diet, the treatment of Addison's disease by the new extract, the treatment of amenorrhœa by the use of emetin, recently available commercially, the chloride treatment of pneumonia, were all mentioned by him.

"Recent advances in surgery" discussed by Dr. S. Larson were operation for epilepsy in selected cases, and extension of the work in chest surgery. He stated that sodium amytal, which was a short time ago used enthusiastically, is now used much less, and that avertin is now used only as a basal anæsthetic, supplemented by something else. He described Keen's method of treatment of carcinoma of the breast which is the insertion of radium needles into the tissue.

"Recent advances in obstetrics" were described by Dr. M. A. Currie. He described the Ascheim-Zondek test for pregnancy. He gave in detail particulars of a new vaginal antiseptic composed of iodine, mercurochrome and glycerine: he condemned high forceps as conducive to fetal injury, and described the clinical entity of anæmia in pregnancy. He closed his address by urging greater attention to the blood picture of the pregnant woman.

Dr. Lloyd Brown described the clinical and laboratory picture of thrombocytopænia, a form of anæmia recently reported in infants.

The officers elected for the new year are:— *President*, Dr. S. E. Moore; *First Vice-president*, Dr. P. L. Straith; *Second Vice-president*, Dr. Hugh McLean; *Secretary*, Dr. S. Larson; *Treasurer*, Dr. C. May; *Executive*, Drs. S. E. Kraminsky, J. T. Waddell, J. B. Ritchie, and F. A. Corbett.

LILLIAN A. CHASE

THE SASKATOON DISTRICT MEDICAL SOCIETY

The annual meeting of the Saskatoon District Medical Society was held in the clinic room of St. Paul's Hospital on November 19th, with Dr. F. A. Malloy, president, in the chair. Dr. W. A. Dakin, of Regina, gave a paper on the "Diagnosis and treatment of renal and ureteral calculi." This was followed by a paper on the "Diagnosis and treatment of subphrenic abscess after peritonitis" by Dr. G. H. Lee, of Shaunavon. Both papers were illustrated with clinical reports from recent case records.

The following officers were elected:— *President*, Dr. J. A. Valens; *Vice-president*, Dr. T. M. McKay; *Secretary-treasurer*, Dr. W. Oliver; other members of the executive, Drs. L. Schulman, D. Croll, A. E. Kyles; *Representative to the Provincial Association*, Dr. A. F. Malloy.

LILLIAN A. CHASE

THE SOUTH WATERLOO MEDICAL SOCIETY

The South Waterloo Medical Society met at the Galt Golf Club on the evening of September 18th, when a complimentary dinner was given in honour of Dr. J. H. Radford, of Galt, who, recently, was elected President of the Ontario Medical Health Officers' Association. Dr. L. J. Austin, of Kingston, President of the Ontario Medical Association, held a clinic at 4.00 p.m. on "Injuries to the elbow in children".

After the dinner, Dr. Ward Woolner, of Ayr,

gave a brief talk on the life and work of Dr. Radford, who, before graduating in medicine, was a school teacher. He came to Galt to practise medicine in 1880. He has been a member of the Ontario Medical Association for fifty years, and for the past fifteen years has been Medical Officer of Health for the city. The Hon. Dr. J. M. Robb, Minister of Health for Ontario, also spoke in praise of Dr. Radford's work as a Health Officer, later discussing the tuberculosis and cancer problems as they apply to this province. Dr. Robb mentioned many interesting events in connection with the recent trip to England of the Royal Commission appointed to study the treatment of cancer. Dr. Radford then, in replying, recounted some very interesting experiences of his fifty-one years of practice in Galt, after which Dr. Austin gave a talk on "My experiences as a prisoner of war in Germany". This was one of the most interesting meetings ever held by the South Waterloo Medical Society.

The following are the newly elected officers of this Society:— *President,* Dr. C. Reist, Preston; *Vice-president,* Dr. J. Seaton, Sheffield; *Secretary,* Dr. W. L. Catherwood, Galt; *Treasurer,* Dr. D. Buchanan, Galt.

THE WINNIPEG MEDICAL SOCIETY

The regular monthly meeting of the Winnipeg Medical Society was held in the Physiology Lecture Theatre of the Medical College on Friday, November 20th.

The Hon. Dr. E. W. Montgomery, Minister of Health and Public Welfare, gave an illustrated address on "Rocks and Rivers of the North," based on two trips which he made through northern Manitoba as far as Churchill. He told of the geology of that enormous district, and also of the vast rivers, particularly the Nelson and the Burntwood, with their tremendous rapids, which are a potential source of energy.

Drs. C. W. MacCharles, J. C. McMillan, Sara Meltzer, and M. R. MacCharles presented reports on two cases of myeloma.

It is time that organized medicine took up, seriously, the whole question of medical economics. We should not only survey the field, and pass pious resolutions. We should be prepared to go to governmental bodies, and state our case—not graspingly or unreasonably, but as a matter of ordinary honest and common fairness, we should make it plain that we are awaking to a sense of our own reasonable dues—and that we are determined to insist upon them—*Bull. Vancouver Med. Ass.,* 1931, 8: 45.

Before the gates of excellence the high gods have placed sweat. Long is the road thereto and rough and steep at the first. But when the height is achieved then there is ease—though grievously hard in the winning.—Hesiod's *Works and Days.*

Special Correspondence

The London Letter

(From our own correspondent)

Of various interesting events in the last few weeks perhaps the most important was the inauguration and first dinner of the British College of Obstetricians and Gynæcologists. It is known that the foundation of the College was attended with considerable difficulty. The pioneers of the movement for a separate corporation were not favourably received by the existing bodies, and positive arguments had to be adduced. Particularly, the possibility of a better organization of the campaign against our high maternal mortality rate seems to have done the trick, and already the College has been officially approached by the Ministry of Health in this matter. Perhaps even more important and significant of the satisfactory state of affairs is the fact that the College has been asked to nominate a list of examiners for the diploma of the conjoint board of the Colleges of Physicians and Surgeons. Far from detracting from the importance of the two older corporations the new College by its close cooperation will strengthen their position, and it is not too much to hope, as Sir Thomas said at the dinner, that we may one day have an Academy of Medicine in this country of which these three colleges will be the main pillars.

The biennial epidemic of measles in London has already begun and the authorities are making all arrangements to deal with it. *The Times* horrified some of the profession the other day by assuring its readers that the disease "remains almost entirely unpreventable". Yet numerous workers even in the last few months have testified to the great value of the whole blood or serum from measles-convalescent patients. There seems to be some apprehension lest the widespread use of such serum (were this practical on other counts) might actually reduce the national immunity to the disease and this is easily answered by saying, as Dr. Percy Stocks, the eminent statistician, has said this week, let children have measles, but modify the attack with serum so that it is mild and uncomplicated. Naturally measles is a greater menace to the child population than either scarlet fever or diphtheria; causing in the last four years eight times as many deaths as scarlet fever and one and a half times as many as diphtheria. It ought to be possible to use serum to modify the attack of measles in much the same way as a serum comes to the practitioner's assistance in the other two disorders mentioned, even allowing for a difference in mechanism. The London County Council have all arrangements made for

a rush on their hospital accommodation, especially between February and April, 1932, when the greatest pressure is expected.

Asthma continues to be one of the diseases which is being attacked by organized team research. As so often happen in these "teams," members fall out with each other and the "urinary proteose" which, as the latest report of the Asthma Research Council says, is the main preoccupation of the clinic at Guy's Hospital, has been roundly denounced as an impostor by an authority from another clinic. Meanwhile the centre at the Hospital for Sick Children, Great Ormond Street, continues its very valuable investigations into the beginnings of asthma. Over 1,000 children have already been studied. Hereditary influences have been found in two out of every three cases, twice as often through the mother's as through the father's. In cases with no definite history of heredity there was nearly always some severe pulmonary illness at the onset of the trouble. The greatest number of sufferers was found among the pampered, only children of skilled artisans and educated people, and the commonest causes in the home were feather or horsehair beds, animal pets, or dust. Treatment seems to be good in these cases. While it is not possible to say exactly what causes asthma—which is what the Asthma Research Council is out to discover—the work so far has certainly revealed many other interesting facts and pointed to several important lines of treatment.

Research in cancer is also one which is kept before the public eye by reports of "cures" or "theories," without any very definite advance towards the discovery of its causation. The publication of Gye and Purdy's book on the cause of cancer has been an important event, but the complicated nature of their theory must naturally make the experts pause before they pronounce upon this new work. Suffice it to say that, while extending Gye's original theory of two factors, one a virus, the new book does not altogether clear up the points at which this theory has been criticized.

Lord Moynihan laid the corner stone of the new Wellcome Research Institute recently. This building, situated close to University College and to the Tropical Diseases Hospital, is to house the various laboratories and museums founded by Dr. Henry S. Wellcome, the far-seeing and active creator of various important establishments at home and abroad. Visitors to London ought always to visit the Wellcome Historical Museum which is quite unique. This and other museums will soon be found in the new building which is springing up.

ALAN MONCRIEFF

London, December, 1931.

The Edinburgh Letter

(From our own correspondent)

During the past year doctors from all over the world have availed themselves of the facilities which are offered for post-graduate instruction in the Edinburgh Medical School. The principal courses are concentrated into the long summer vacation when it is possible for the teachers to give those attending their individual attention. The courses are conveniently divided into General and Special. Under the heading of General there are intensive courses; in Medicine, intended chiefly for those in general practice; in Surgery, which is favoured as a rule by those aspiring to the Fellowship; and a course in Midwifery and Diseases of Children which makes a wide appeal. Subordinate to these more comprehensive courses, and arranged so far as possible at times which are not occupied, is a large and varied number of special classes in which the attendance is limited and the instruction is of a practical nature. These classes are always well patronized, and each year as the demand arises additional subjects are taught in this way. Apart from the Vacation Courses, a class in Surgery and in Surgical Pathology is held during each academic term. These classes have always been successful and are attended by a large number of graduates. A course in Clinical Medicine was conducted the last summer term, and, as this proved popular and was largely attended, it is proposed at an early date to arrange that this class will be conducted during the autumn and spring terms as well. In the past, a number of graduates have felt that no opportunity was given them to express their views. In order to meet this criticism a number of discussions has been introduced into the general courses, and those proved to be so successful that they will undoubtedly be continued next year. On the social side a very friendly spirit existed among the graduates, and for the first time since before the War a dinner was organized at which many of the teachers were present as guests. This innovation proved so successful that a similar function will certainly be held next year.

Scotland appears to be ahead of England in the provision of special schools of a modern and handsome type for physically or mentally defective children. The country's latest institution of this kind is the Dalton Special School for Invalid Children, situated in the county of Lanark, midway between Cambuslang and Blantyre. It is built in one storey and has eight classrooms and accommodation for 230 children. The scheme includes departments for woodwork, metal work, cobbling, cookery, laundry and housewifery, and there are spray baths, dressing rooms, a rest shelter, and a remedial gymnasium. The classrooms all face

south, so as to give the maximum of light and warmth. They are constructed on the open-air principle, and throughout the scheme of decoration is most artistic and suitable for the little folk. To-day, in Scotland, the Education Authorities have made provision for 5,500 children suffering from physical defects, while 3,800 places have been found for those who are mentally handicapped.

A scheme for free medical examination along the same lines as that introduced in certain Canadian universities by Dr. Tait Mackenzie has now been functioning in Edinburgh for a year. Although it is not compulsory for the students, the response has been most gratifying to the organizing committee, and insures that the efforts which they have made will very quickly bear fruit. Each student who is examined is placed in one of six grades and those in the lower ones are given suitable facilities for improving their physical health in order to insure that at the end of the university career their bodily fitness will have kept pace with their mental development. The advantage of such medical examination at the commencement of a university career will soon be appreciated by the student, when it is known that in the past men have been found to be physically unfit for the careers which they had spent years in preparing themselves for. An earlier knowledge of the true state of their health would have saved much unnecessary disappointment and would have enabled them to adjust their lives according to their physical abilities.

The University Court of St. Andrew's has opened a new student residence at Deans Court, to supplement the accommodation already provided at St. Salvator's Hall. The inauguration of this new establishment is in response to an increasing demand on the part of the students to be housed in official quarters. Deans Court occupies the site of the ancient lodging of the archdeacon of St. Andrew's, opposite the ruins of the Cathedral. The house is one of the most picturesque dwellings in St. Andrew's, entered from a courtyard with an old-world air, and having a large garden. From the windows glimpses may be caught of St. Andrew's Bay, as well as of the Cathedral ruins. Since the University Court acquired Deans Court, about a year ago, extensive alterations have been made to adapt it to the special purpose it is to serve as a students' residence. The main idea was to make it as convenient as St. Salvator's Hall, which was opened a year ago, without greatly modifying its general characteristics as a link with the past. The alterations have achieved that object.

Mr. J. W. Dowden has been elected *President;* Dr. J. Haig Ferguson, *Vice-president;* and Mr. J. W. Struthers, *Treasurer* and *Secretary* of the Royal College of Surgeons, for the ensuing year.

At the annual meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, the following bearers were elected: *President,* Mr. R. Barclay Ness; *Visitor,* Dr. J. M. Munro; *Honorary Treasurer,* Dr. J. H. Macdonald.

Dr. Robert William Craig, of Pathhead, Ford, Midlothian, has been appointed Scottish Medical Secretary of the British Medical Association.

GEORGE GIBSON

23 Cluny Terrace, Edinburgh.

The Australian Letter

(From our own correspondent)

As might be expected from the manner of colonization of Australia, the public health services have developed at the outset as State functions. Settlement took place in various isolated ports or places of landing and these became the main cities, and, in certain cases, the capitals of the States in which are located the seats of State government. Each of the six States of the Commonwealth has now its centralized health department, responsible for public health administration in many or all of its phases, according to the varying health legislation of the different States.

Development of the country soon demonstrated that certain social and political concerns were of common interest to all the States —the example, par excellence, being defence, which could only be successfully handled by cooperation. The realization of this and the organizing of the necessary machinery for such desirable cooperation, ultimately led through many phases to the Federation of the States into the Commonwealth in 1901. It was not however until 1908 that any health matters were dealt with under Commonwealth jurisdiction. In that year, by the Commonwealth Quarantine Act, this important branch of public health *and defence* became a matter of Federal administration, and the former varying quarantine systems of the individual States disappeared. A Director of Quarantine for the Commonwealth was appointed in 1909. From these beginnings has developed the Commonwealth Department of Public Health, with its headquarters now situated in the Federal Capital, Canberra. Quarantine is interpreted in its widest sense and includes, as well as human diseases, those of animals and plants.

The present functions of this Department are well summarized in the following statement.

"The administration of the Quarantine Act; the investigation of causes of disease and death and the establishment and control of laboratories for this purpose; the control of the Commonwealth Serum Laboratories and the commercial distribution of products manufac-

tured in these laboratories; the methods of prevention of disease; the collection of sanitary data and the investigation of all factors affecting health in industry. The education of the public in matters of public health; the administration of any subsidy made by the Commonwealth with the object of assisting any effort made by any State government or public authority directed towards the eradication, prevention or control of disease; the conducting of campaigns of prevention of disease in which more than one State is interested; the administrative control of the Australian Institute of Tropical Medicine; the administrative control of the infectious diseases amongst discharged members of the Australian Imperial Forces; the study of the behaviour of communicable diseases throughout the world, and acting as an intelligence bureau for the collection and dissemination of information; the control of venereal disease and infectious diseases in the Mercantile Marine; the inspection of vessels and the medical inspection of seamen under the Navigation Act; the control of the importation of food and drugs under the Commerce Act; generally to inspire and coordinate public health measures; and any other functions which may be assigned to it."

It will thus be seen that the Commonwealth Health Organization has jurisdiction and control only over health matters which are really federal in character, that is, over matters which affect more than one State. Its paramount duty then is quarantine as a continental and a world problem. It is responsible for quarantine from the inter-state aspect, but it has, however, no jurisdiction or administrative powers in regard to infectious diseases within a State; this naturally is a local or domestic health matter of the State. It has however found further fields of activity in an advisory and educative capacity, rather than in definite administration, as is well seen from the functions as set out above. It is naturally the organization which handles official international and foreign health matters; thus for example it is the Australian link with the Health Section of the League of Nations and with the Industrial Health administration of the International Labour Office. It has, too, carried out valuable coordinating functions in matters which concern health. An example of such is afforded in the realm of the pure foods and drugs standards and legislation. These standards and methods of administration were developed by the individual States, unevenly naturally, owing to the widely different conditions and interests existing in the different States. After the compilation of a very considerable mass of scientific and practical information and deliberations on methods of analyses and forms of legislation—mostly of a pioneering character,—in regard to standards, tests, etc., and the enactment of laws by the States, the Commonwealth called a Conference of State representatives in order to coordinate these through the Commonwealth, a measure which became necessary for inter-state trade, and especially so as these standards are enforced on the world in regard to imported foods and drugs coming into Australia.

More recently an effort in another direction has been taken towards coordination, but up to the present without practical results. Maternal and infant welfare activities developed largely through voluntary effort, later becoming partially the responsibilities of the State Health Services. The Commonwealth at an early date, in 1912, indulged in an effort towards amelioration of the perils of maternity, by the establishment of the "Baby Bonus" by an Act of Parliament which made available to the mother of every viable child the sum of £5. It is interesting to note that through the years this sum has been claimed practically up to 100 per cent of births. It is only just now by reason of the dire financial position in which the Commonwealth Government has found itself that any restrictions have been placed on this grant, which in future is only to be available for those under a certain income limit, and the bonus is to be reduced to £4.

The more enlightened public opinion, which has developed since the inception of this "Baby Bonus" scheme, which gives no guarantee of safeguarding services for the mother or infant, has regretted that these funds have not been available for definite concrete efforts towards the prevention of maternal and infant morbidity and mortality. Some three years ago the Commonwealth Department of Health conducted a survey into these problems, and invited to Australia for this purpose Dame Janet Campbell, of the Ministry of Health of Great Britain, and chief of the maternal and infant welfare activities. In her recommendations she advocated the establishment of a coordinating department of maternal and infant welfare in charge of a special director, as a section of the Commonwealth Department of Health. Up to the present time this procedure has not been adopted, and under existing financial conditions it is unlikely to take place in the immediate future.

There is no well developed scheme of social insurance, including health, in any of the States. This is probably the chief social question which has to be feared. Inquiries and Royal Commissions have been held recently into these matters by the Commonwealth, and the present economic situation renders it necessary that some action should be taken. No system of relief of distress and sickness, such as the old Poor Law of England, has been established, but the Common-

wealth is responsible for certain relief measures concerned with health, such as compensation for accidents and certain diseases, *e.g.*, miner's phthisis, for old age and invalid pensions.

It is obvious from this brief review of the health administration of the Federal authorities that the bulk of the responsibility still rests with the States as far as public health is concerned. It is hoped to deal with this subject at a later date.

ETHEL E. OSBORNE

University of Melbourne.

Letters, Notes and Queries

Poliomyelitis

To the Editor:

I have been greatly interested in the report of the sporadic case of poliomyelitis by Doctor Mirsky in your issue of November, 1931. During the year 1930, over 100 physicians treated cases of this disease in my District (No. 4) of eight counties in central Ontario, and, as District Officer of Health, I was drawn very closely into the fight against it, organizing the distribution of serum and becoming travelling and "Long-distance Consultant" over a radius of eighty miles. I saw a great number of cases and, by phone, dealt with the diagnosis and course of the disease in a good many more cases than I saw. In the light of this experience, and with the desire to add something to the successful treatment of these cases, I would like to discuss this case report.

The sudden onset as described is very typical of almost all cases of any severity, as is also the picture of a child obviously very ill out of all proportion to the severity of any symptoms which can be adduced. The tremor of the hands, coupled with the limitation of the forward bending of the spinal column, is also very characteristic. The latter symptom is best adduced by voluntary bending while sitting on a flat surface. The observer standing to one side can thus best note any flattening of the natural arch. On these things the diagnosis properly rests, as it did in this case. The spinal fluid count is only confirmatory, though in doubtful cases its weight may be decisive. Luckily, it is in these doubtful cases that one can afford to wait even some hours for the result of a fluid count. They are the light cases as a rule. That the clinical evidence is adequate for diagnosis is evident in that, in my District, outlying and rural areas which relied only on clinical evidence gave a smaller percentage of cases of missed diagnosis than did urban centres where cell counts could easily be done.

The history I have found to be more important from the quantitative than the qualitative standpoint, For instance. Had it at once been revealed that this case had had the earlier indisposition and castor oil, it would not have materially aided Doctor Mirsky in diagnosing the presence of poliomyelitis, but it would have indicated the second hump of the dromedary type of case where there is no time to be lost and where serum is likely to have to be pushed. Another point with which I was greatly impressed last year was the number of cases in which there was a family history of poliomyelitis and that such cases tended to be unusually severe.

As to the third point of interest, "the unfortunate inefficacy of the serum in this case". Last year, some two and one-half months after the commencement of the epidemic, I was called up during one night by three physicians concerning three cases from as many points of the compass and some twenty, sixty and forty miles distant respectively. After discussing the cases over the phone, I advised the one that he almost certainly did not have poliomyelitis to deal with, but that a spinal fluid cell count would pretty well clinch the matter; the second, that his case was extremely suspicious of poliomyelitis but that it was early enough to be safely watched for developments, and that I would send him the serum in the morning, for use if necessary, or return if not; the third was advised that his case was certainly poliomyelitis, that a car be dispatched at once to me for the serum which could not be gotten into the patient too soon; also that I would send two doses with the messenger, the second to be given if the patient was not improved in twelve hours after the first dose, or if the temperature had not taken a material drop close to normal in twenty hours after the first dose. I quote this simply to show that two and one-half months of the outbreak had brought me to some very definite conclusions. One of these is, that so long as the temperature remains up the disease process is active and doing damage. One or two cases in point in the first month of the outbreak and the clear reasoning of the physician in charge of one of them taught me a lesson on the necessity of pushing the serum when the temperature does not respond. It is with humble thankfulness I state that thereafter I have had nothing to regret in the discharge of the heavy responsibility which was mine.

Had I been venturing an opinion on this case, I would have advised repeating the serum in the morning when the temperature was up rather than down in ten to twelve hours, and again repeating in the evening, if a material

drop had not then occurred. I would venture to say that in the great majority of such cases so treated, little or no paralysis would supervene. The pushing of the serum must be without delay, however, if it is to be fully successful. I have no experience with giving an initial double dose, but if one could successfully estimate which cases had little resistance or had an extra heavy invasion of the virus it should be a very useful procedure.

One other thing I would venture to predict that Doctor Mirsky will be agreeably surprised at the amount of recovery from the paralysis this case will show in a year's time, provided that the patient will accept proper guidance in muscle training in the coming months. I am convinced that, in the amount of ultimate recovery from paralysis, the use of serum shows a benefit which I have not heretofore seen noted in the literature.

N. H. SUTTON, M.B., D.P.H.,
District Officer of Health, No. 4 Dist.
Peterboro, Ont.,
November 28, 1931.

Insurance for Illness

To the Editor:

The enclosed from the *Manitoba Free Press* of to-day will interest you. Its significance will not be lost upon anyone who is in touch with the economic situation of the rural districts of the prairie provinces, where, in matters medical, a situation exists that is intolerable both to the public and the members of our profession. Many municipalities are bankrupt or on the verge thereof; the residents have no money, and the doctor is called upon to bear a very heavy load. The hard times of the past two years have done much to establish in the eyes of the physician and the public the "municipal doctor" system as one sound in principle and satisfactory in the results obtained. The main danger that I foresee is that the remuneration offered may be insufficient to attract to this particular field good men. In the words of President Angell, of Yale, in his address to the American College of Surgeons last month, "Any plan which denies the competent physician rewards of individual effort or superior ability will ultimately be detrimental to public welfare."

I come back to renewed consideration of the insurance principle as applied to medical practice. In association with an insurance expert I have been making an effort to evolve a plan under which the more outstanding grounds for criticism of the existing system might be eliminated.

I have not yet read "Paying Your Sickness Bills," by Davis, but have sent for it. I judge from the extract you publish from the Chicago University Press that he favours group insurance. The plan I have in mind would apply to the group of married men of moderate means, ($1,500-$3,500) with growing families. My idea would be to supply surgical aid, hospitalization, and nursing service on a fixed premium basis. The estimate has been given me of $18 for a $250 liability, and $33 for $500. The actuarial soundness of these figures is not guaranteed.

I think it will be agreed that the cost of the services named is responsible for much of the existing criticism and dissatisfaction. If through adoption of the insurance principle these major items of medical expense could be met, the problem of meeting the bills of the family doctor would disappear in thousands of cases.

Do you not think that the Canadian Medical Association, in conjunction with the life insurance companies, who presumably would approve of any plan to lower mortality, should assume the leadership in this matter, and seriously set about evolving a plan that would be of material advantage to thousands of our people, and especially those of limited means who are obliged to maintain a certain appearance in the community on account of their business or social status, upon whom the financial burdens of illness frequently rest with crushing force and far-reaching consequences? One thing seems certain, and that is, if we delay unduly in formulating plans to meet the economic needs of the hour, we shall find ourselves the victim of an enforced system of state control, that will be neither welcome nor efficient, and that will be open to all the objections, political, and bureaucratic that seems inherent in our democratic method of governing ourselves, from which may the Lord spare us.

W. HARVEY SMITH.
Winnipeg,
November 10, 1931.

[The editorials referred to in Doctor Smith's letter will be found in this issue of the *Journal* on pages 109-10.]

A theory founded on Nature, that should bind together the scattered facts of medical knowledge, and converge into one point of view the laws of organic life, would thus on many accounts contribute to the interests of society. It would capacitate men of moderate abilities to practise the art of healing with real advantage to the public; it would enable every man of literary attainments to distinguish the genuine disciples of medicine from those of boastful effrontery or of wily address, and would teach mankind in some important situations the knowledge of themselves.—Darwin in *Zoonomia.*

Topics of Current Interest

The Variola-Vaccinia Flocculation Test

The application of the flocculation test of Gordon to the diagnosis of small-pox has already formed the subject of a report to the Medical Research Council (Special Report Series, No. 143) by Gurgess, Craigie, and Tulloch. Their results applied to material from ninety-six different sources — variola minor, varicella, and septic rashes—and left little doubt as to the specificity of the reaction as well as to its utility in the diagnosis of small-pox. Craigie and Tulloch have continued the investigation with a view not only to giving the test a more extended trial but also to examining more closely its mechanism and the possibility of improving it. Their findings, incorporated in a report to the Medical Research Council, constitute a most valuable addition to our knowledge of immunity in virus infections.* The extended application of the test comprised a further 129 specimens, and the results obtained amply confirm the opinion expressed in the earlier report that the reaction is both specific and delicate. The authors also show how the technique of the test can be improved by freeing the antigen from impurities which interfere with the reaction, and indicate the best methods for the preservation of the flocculating serum. But this is not the most interesting portion of the report. Evidence is produced to show that the reaction depends alone on virus and specific antibody, that contaminating organisms play no part in it (as claimed by Schultz and his colleagues), and, further, that a firm union between virus and antibody takes place in the test tube. Briefly, the reaction behaves like other antigen-antibody reactions, which is what one would have expected. The most valuable part of Craigie and Tulloch's work, however, relates to the production of immunity with neutralized virus. They find that vaccinia virus neutralized with antiserum, although unable to provoke a reaction when injected intradermally, can yet be shown to contain active virus when inoculated intra-testicularly. Further, when this neutralized virus is introduced subcutaneously in rabbits, despite the fact that no reaction occurs, a solid immunity to vaccinia virus is evoked. Similar results have been obtained by Rhoads (*J. Exper Med.*, 1931, **53**: 185). Even one inoculation of a surprisingly small amount of virus, so treated, proved sufficient to give a solid immunity in rabbits as tested by dermal inoculation, and there is evidence that the sensitized virus, when dried *in vacuo*, is a stable product. Of course, more work is required on this question, and Craigie and Tulloch are commendably cautious in drawing conclusions, but it would seem that it is along these lines, so clearly indicated by their investigations, that the solution of the problem of a safe method of small-pox prophylaxis will be found. —*Brit. M. J.*, 1931, **2**: 812.

* Medical Research Council. Special Report Series, No. 156. Further Investigations on the Variola-Vaccinia Flocculation Reaction. By James Craigie and W. J. Tulloch, London: H. M. Stationery Office, 1931. (3s. net.)

The Prevention of Simple Goitre

The ease and simplicity with which goitre prophylaxis is accomplished has nearly been the undoing of this very valuable procedure, according to a recent statement by the United States Public Health Service. Many persons with goitre, attracted by the apparent ease with which the malady may be prevented, have concluded that what is useful for prophylaxis of the simple form is likewise efficient as a means of treating all types of the disease. Much harm has been done by this erroneous assumption. It is necessary, therefore, to caution people that there are certain goitres which are made worse by the ingestion of iodine. Moreover, the measures that may be effective in preventing simple goitre are in no wise useful in forestalling other and more severe forms of the disease.

The following questions quite naturally arise regarding simple goitre. First, why should simple goitre be prevented? Second, is the condition more than a deformity of the neck? These reasonable questions may be answered by citing the experiences of certain foreign countries in which the disease prevails unduly. When unchecked, simple goitre is often associated with mental and physical degenerations, especially deaf mutism, feeble-mindedness, and the idiocy of cretinism. The ill effects of uncontrolled goitre are practically severe in subsequent generations. Fortunately, the affection has not reached this degree of intensity in the United States, nor is it likely that it will reach it.

The causes of simple enlargement of the thyroid gland may be conveniently classed as immediate and remote. The immediate cause of this condition is now believed to be a complete absence or marked deficiency of the iodine necessary for the normal functioning of the gland. Anything which interferes with the intake or utilization of iodine available in normal quantities may likewise cause enlargement of the organ. Thus, infections, intoxications, faulty diets, and such periods of stress in female life as puberty, pregnancy, or the change of life, may be mentioned as remote or underlying causes of simple goitre. It is a matter of common knowledge that females are more prone to simple goitre than are males.

The most satisfactory method of administering iodine for the prevention of simple goitre is by adapting the remedy to each person in need of it . In this way accurate dosage and nominal supervision is insured. Obviously this method is costly and cumbersome, reaching only a small portion of those requiring the protection. In order to overcome these objections, wholesale prophylaxis by the use of iodized table salt and iodized water supplies has been suggested. While both of these methods are theoretically sound, it is not yet definitely known whether they are effective and, at the same time, incapable of causing harm to persons with existing goitrous enlargements. Therefore, the individual method is preferable at the present time.

It is likely that the regular consumption of foods naturally rich in iodine will aid in preventing goitre. It is known, for instance, that marine algæ, deep sea fish, and crustaceans are particularly rich in iodine. But here again the uncertainty of dosage and economic factors are involved. Variations in the iodine content of food and water probably account to a considerable extent for the differences in goitre incidence in the United States. Until more definite knowledge becomes available concerning the value of iodized salt, iodized water, and iodized foods, it appears best to individualize in goitre prophylaxis.

Goitre prophylaxis is most telling in its effects among children between the ages of 11 and 17, especially among girls. Even more important, as has been pointed out, is the institution of appropriate prophylaxis before a person is born. Under the supervision of a skilled physician a prospective mother may receive protection not only for her own thyroid but also for the gland of the expected child. Any plan, therefore, that safeguards the thyroid gland during fetal life, adolescence, and pregnancy may confidently be expected to aid in eliminating simple goitre.—*United States Public Health Service,* Oct. 10, 1931.

The World To-Day

"Few will deny that the world is in a state to provoke the laughter of the gods." The remark is made by Prof. William McDougall in a prefatory note to his expanded Ludwig Mond lecture. The gods may well laugh at the world confusion that has followed the high hopes of the victors of the Great War, and the statesmen of our Western civilization seem as powerless as the characters in a Greek tragedy to understand a threatening disaster in which their own actions and principles, however well intentioned, are undeniably playing the greatest and most important part. To the reader of this little book the strife of our general election, with its concentration upon the necessities of the moment, appears at best a local effort to temporize with world-wide economic difficulties the causes of which must be sought in a fundamental defect of our social machinery. McDougall believes this defect, whatever it may be, has arisen from the devotion of our energies to the material sciences and our almost complete neglect of the study of human and social factors. He points, for example, to the effect of mass production in America in increasing "technological unemployment"—the excess of firing over hiring—and asserts that every step of progress physical science may make in the near future can only add to our dangers and perplexities by increasing the top-heaviness and the lop-sidedness of our civilization. In one group of American companies the output per man has increased by 74 per cent since 1919; farmers, still the backbone of the country, were meanwhile finding their position increasingly difficult, and with the fall in wheat prices it has become desperate. The combination of increased production and increasing unemployment all over the world renders paradoxical our own necessity for economy and stimulation of output, and for this paradox economists have no convincing explanation. Indeed, for economists McDougall has little respect. He admits that their predictions are not always wrong; they make so many that the law of chance favours them sooner or later. But the less exacting test of power to explain after the event finds them lacking. Could there be, he asks, a greater diversity of opinions and acuter opposition of authorities than on the question of the grounds of the present world-wide economic slump, or any other economic phenomenon you please? The essential economic facts are human passions and interests, and text-books are full of inexorable laws whose only defect is that mankind will not obey them.

The remedy is pointed out by Dr. Abraham Flexner, who wrote, in his recent book on Universities, "Somewhere, away from the hurly-burly of practical responsibility and action, the social and political problems involved in these disorders must be exposed." Our frame of mind is to be recognized as the cause of the paradox of distress in the midst of plenty, and a psychological foundation must be laid in order to convert economics from a chaos to a science, though psychology may never be able to present simple conclusions in the shape of a formula. The hedonistic assertion about human motivation must be discarded, and instead we must try to answer the question, "What place has thought or reason in guiding man's social behaviour?" Our most powerful intellects should be diverted from the physical sciences into research into the biological, the human, and the social sciences. We need, too, a new scale of values in the public mind, a scale in which such prestige shall attach

to the social sciences as hitherto physical science alone has enjoyed. With this accomplished, and premature applications to practical problems being avoided, McDougall thinks that substantial progress might be expected within some forty years, but he doubts whether our civilization can survive in the meantime.—*The Lancet*, 1931, **2**: 972.

Right Rev. Dr. Barnes and the Theory of Evolution

Life after death was the subject of the All Saints' Day sermon at the Chapel Royal, St. James, by the Bishop of Birmingham (Dr. E. W. Barnes) on Sunday.

"Is it true," he asked, "that 'the souls of the righteous are in the hand of God'? That the reward of righteousness is eternal life, God's gift to his servants, is one of the central affirmations of the Christian message. It was probably held with unquestioned faith in Western Europe from, say, the fourth century to the beginning of the eighteenth century. To-day it is rejected by many, and with many it survives merely as a hope which they refuse to examine because they dare not set it aside.

"And the reason for this change of outlook is known to us all. So long as the earth was deemed central and unique in the cosmos, with man specially created to place upon it, by the direct action of God some 6,000 years ago, so long as such belief survived, the fact of a future life is not only credible but natural. But with our recent enlargements of knowledge doubts and difficulties have become many."

The earth, he continued, was but a satellite of a star, apparently similar to thousands of millions of other stars in our universe, and there appeared to be millions of other and similar universes. It was, to say the least, highly improbable that this earth of ours was in any way unique. There had been for some thousand million years a slow and steady development of life upon this planet, and by this vast and still ill-understood process man had grown. And how, it was asked, could he be different from "the beasts of the field that perish"? Wherein lay the principle of immortality?

Man's constitution seemed to eliminate the idea that any element of his personality could survive bodily death. "And yet," Dr. Barnes said, "I personally hold that any such conclusion is to be rejected. Man, as it seems to me, is potentially immortal. I believe that they who seek to serve Christ will after death enjoy eternal life with Him. Those on earth who have known God do not cease to exist when the body dies. God, in short, is not the god of the dead, but of the living." On this earth life would flicker out when the solar heat passed away, but in some other realm, he was forced to assume, all that was of value in his personality would endure.—*The Weekly Times*, Nov. 5, 1931.

The Doctors' Dilemma

"The doctors of Wainwright district in Alberta have gone on strike over the free service racket. They feel that they are carrying far more of the depression than is fair and that after all, even if the profession is noble, its members have to live. The physicians of that part of Alberta have met and passed a resolution. It reads:

'That from and after January 1, 1932, no medical service or attendance shall be given unless such service is paid for in cash at the time it is rendered or the municipality in which the patient resides guarantees payment, and that any doctor who breaks the agreement shall forfeit and pay, to the other parties to the agreement the sum of one hundred dollars as liquidated damages for each and every breach of such covenant.'

"The embattled doctors of Wainwright have sent this resolution on to the Alberta Medical Association and requested that a copy be sent to every practising physician in the province and that a meeting be called to discuss provincial action.

"If this action should eventuate it will not be the first time Alberta has got itself into the forefront in matters concerning the medical profession, especially in the field of Government action. One of these activities has recently received eulogistic notice from Dr. Harris McPhedran, of Toronto, President of the Canadian Academy of Medicine. The reference was to the enactment whereby licenses for general medicine only are issued to medical graduates and doctors are prohibited from calling themselves "specialists" until their qualifications for such a claim have been passed upon by a competent board of experienced professional men.

"Perhaps Wainwright practitioners have come to the conclusion that if the public sets itself to discipline the profession, the profession should take a turn at telling the public where it gets off at. It will be difficult, however, for the Wainwright or any other aggregation of doctors to withstand the pressure both of their own good will and of long tradition when they are called to minister to suffering. Perhaps medical associations will note, also, that the whole situation has a bearing upon state regulation of medical services."—*Manitoba Free Press*, Nov. 10, 1931.

"Members of the medical and other professions are feeling the brunt of the depression both through the falling off of business and difficulty in collecting accounts. With the doctors in some rural sections of the West the difficulty in collecting has apparently become acute. For instance, at a recent meeting of the Eastern Saskatchewan Medical Association at Broadview, this matter was seriously discussed and the view was expressed, that, while adequate medical services should be maintained in this time of depression, the whole load should not fall upon the doctors.

"It might be said, of course, that the doctors in the cities have similar difficulty in collecting accounts, and that members of other professions, as well as many business men, are all in the same boat, and that it would be difficult to draw the line if the government came to the aid of any one class.

"But the services of the doctors in these rural districts are absolutely necessary. In many parts there are no hospitals within reach where those without means could receive medical attention. The doctors are usually lenient in collecting from people who are at all dependable, but if there are sections of the country where it becomes the exception rather than the rule that the doctors are going to be paid for their services within any reasonable time, although their calls may frequently take them many miles away and involve some expense, their position can be readily understood."—*The Manitoba Free Press*, Oct. 30, 1931.

Abstracts from Current Literature

MEDICINE

Diet as a Prophylactic Agent Against Puerperal Sepsis. Green, H. N., Pindar, D., Davis, G., and Mellanby, E., *Brit. M. J.*, 1931, **1**: 595.

A previous paper dealt with the therapeutic effect of vitamin A in puerperal sepsis. The results obtained in treatment suggested the use of the vitamin in prophylaxis. The body has great capacity for storing vitamin A, especially in the liver, but the store may easily be depleted, and reasons are given for the belief that women are frequently deprived of their reserve at the time of childbirth. As the vitamin has an anti-infective action, it is very desirable that there be a good reserve for the puerperal period. In the investigation here recorded 550 parturient women were under observation. Each alternate woman was given an extra supply of vitamins A and D—usually for a month, but in some cases for a fortnight—before delivery. The other women served as controls. Complicating factors were very evenly distributed between the two groups. Of the vitamin-treated cases 1.1 per cent, and of the control cases 4.7 per cent, developed the B.M.A. standard of morbidity—*i.e.*, two rises of temperature to 100°F. or over between the end of the first and the end of the eighth day after delivery. Moreover the incidence of sepsis of a major type was significantly greater in the control group.

The authors conclude that the expectant mother should be placed upon a diet rich in vitamin A for the last month of pregnancy.

W. H. HATTIE

The Rôle of the Streptococcus in Arthritis Deformans. Gray, J. W. and Gowen, C. H., *Am. J. M. Sc.*, 1931, **182**: 682.

Gray and Gowen have confirmed the recently reported observations of Cecil and others that arthritis deformans is due to an alpha-type streptococcal infection of the joints. They have been able to grow this organism from the blood and joint fluid in 62 per cent of 71 cases of arthritis deformans by means of improved technique in cultural methods. They believe that specific vaccine therapy is the most efficient form of therapy, because in their hands cases growing progressively worse on other forms of treatment have been greatly improved or cured under this form of therapy. The vaccine should be prepared from the cultures obtained in the case in question. Failing this, vaccine may be prepared from stock specific strains.

The treatment should be started prior to the removal of foci of infection, as the tonsils, with the idea of preventing undesirable joint reactions following the removal of the focus, and should be continued for a long period of time. The dose of vaccine varies greatly. This and the interval of time between each dose should be so gauged that reactions do not occur. The intravenous method of injection controls the joint infection more quickly than does the subcutaneous injections.

E. S. MILLS

The Effect of Pyrodin Poisoning on the Blood and Hæmolytopoietic System. Bratley, F. G., Burroughs, H. H., Hamilton, D. M. and Kern, C., *Am. J. M. Sc.*, 1931, **182**: 597.

These authors have studied the effect of pyrodin (acetylphenylhydrazin) on the blood and hæmolytopoietic system of dogs and rabbits. The effect of another derivative, phenylhydrazin hydrochloride was also tested. The drugs were administered in solution subcutaneously at suitable intervals of time and the ensuing anæmia was studied daily thereafter. In the rabbit anæmia appeared on the second day after a single injection and reached its maximum on the third day. Without further injection the counts rose from this point. In order to produce a progressively increasing anæmia, larger and larger doses of the drug had to be used, as marked tolerance developed rather quickly. Coincident with the appear-

ance of anæmia the red cells showed a vacuolated appearance (third day). Subsequently round refractile darkly staining intracellular bodies (Heinz-Ehrlich bodies) made their appearance in the erythrocytes. These changes were also noted in similar experiments on dogs. The reaction of the hæmopoietic system to the drug was that of intense hyperplasia, the erythroplastic tissues being ten times as active as the granulocytic elements. Neither drug produced visible degenerative changes and immature blood cells. In some animals myeloid metaplasia was noted in adrenal, spleen and liver. Coincident with the marked destruction of the mature erythrocytes there appeared marked activity of the hæmolytic system, characterized by hyperplasia of reticular and sinusoidal endothelial cells and phagocytosis of degenerated erythrocytes and blood pigment. Degenerative changes were noted in the parenchyma of numerous viscera, but the process was most pronounced in the liver and kidney.

The authors believe that these drugs react with the hæmoglobin of the cell, causing condensation of this pigment, liberation of the condensed pigment from the cell, and finally disintegration of the cell membrane. They further show that the effect of the drug upon the erythropoietic tissues is of a hyperplastic not a hypoplastic nature, contrary to the effect desired in the treatment of such diseases as erythræmia.

E. S. MILLS

A Case of Diabetes Mellitus and Fatty Diarrhœa due to Carcinoma of the Pancreas. Urmy, T. V., Jones, C. M. and Wood, J. C., *Am. J. M. Sc.*, 1931, **182**: 662.

These authors report a case of colloid adenocarcinoma of the pancreas occurring in a man of 46 who was under observation for a period of four years. He had been explored because of increasing jaundice when he first came under observation. At this time the nature of the lesion was discovered and a cholecystogastrostomy performed. Two and one half years later glycosuria was discovered and he was placed on a restricted diet without much improvement. At this time fatty diarrhœa made its appearance. The examination of the duodenal contents showed no lipase or trypsin and abnormally low amylase. At this time the carbohydrate was markedly increased and insulin added. The fat was kept low. The patient immediately began to gain in weight from 44 kilos to 55 kilos. The diarrhœa was controlled and the patient's tolerance to carbohydrate actually increased, becuase he remained sugar-free with increasing amounts of carbohydrate and decreasing amounts of insulin. Hæmorrhage and secondary infection eventually led to the patient's death. The authors, therefore, conclude that a high carbohydrate diet is by far the most advantageous type of diet in external pancreatic insufficiency. The use of insulin is recommended because it aids carbohydrate metabolism and prevents glycosuria. The authors support the claims of Porges and Adlersberg, Geyelin, and others that high carbohydrate-low-fat diets with insulin enhance rather than impair carbohydrate tolerance.

E. S. MILLS

A Survey of Diphtheria Prevention in Philadelphia. Bauer, E. L., *Am. J. M. Sc.*, 1931, **182**: 839.

Bauer reports that the incidence of diphtheria in the city of Philadelphia has been reduced 80 per cent since the immunization of children of infant and pre-school age. Approximately 55 per cent of children in this age period have been immunized and 96,250 of a group of 200,984, or 47.8 per cent, have been immunized by the Department of Public Health. These figures were accumulated in a five-year period from 1926 to 1930. The case rate of diphtheria per one hundred thousand population has taken the following drop since 1925 when it was 205.4. In 1926, 144.4; in 1927, 136.0; in 1928, 101.8; in 1929, 49.9 and in 1930, 32.5. Of the cases of diphtheria less than one per cent occurred in immunes.

The author has shown that bacteriologically the disease is as virulent as ever and the death rate remains unaltered. The reduction in mortality has been accomplished solely by rendering the children immune to the disease.

E. S. MILLS

Nervous and Mental Influences in Angina Pectoris. Roberts, S. R., *Am. Heart J.*, 1931, **7**: 21.

It is aptly pointed out that nervous and mental influences are probably more closely allied to angina than with any other disease of the circulation, save possibly essential hypertension. Angina is on the increase today, probably due to ambition, effort, and community state of mind, and the increasing responsibility that comes with age. In other words, the strain of life and mind is probably the chief factor underlying this condition. To know what is not angina is as important as recognizing the condition. Thoracic pain is grouped as follows:—

(1) Angina pectoris, which is paroxysmal and not necessarily associated with demonstrable heart disease, and varies from a substernal sensation of weight to an agonizing pain radiating to the fingers. (2) Coronary thrombosis, which is similar to angina, but of longer duration and associated with fever or leucocytosis and often a pericardial rub. (3) Acute aortitis. (4) The precordial pain of organic heart disease, valvular disease and heart failure. (5) Neurocirculatory asthenia or the effort syndrome. (6) Aches and pains involving tissues of chest wall. (7) The pains of the more gross lesions, pericarditis, pleurisy, empyema, tumours and referred pain from diseases of the cord and vertebræ. (8) Such

rare conditions as a phlebitis of the thoraco-epigastric vein.

The author believes that when we realize the tremendous power of nervous and mental influences to produce the anginal state as well as the anginal attack, we shall be stimulated to accent the former rather than the latter and at first look for the cause of both in a personality disturbance. The disease is practically unknown in the negro and oriental, both having a very placid nature. The nervous and mental aspects of angina are strongly stressed as being the main etiological factors. As the author states, only the anginous have angina and to have angina is to be more anginous.

W. H. HATFIELD

A Further Report on the Prognosis of Angina Pectoris and Coronary Thrombosis. White, P. D., and Bland, E. F., *Am. Heart J.*, 1931, 7: 1.

The authors present in this article a study of 500 consecutive cases of angina pectoris and 200 consecutive cases of coronary thrombosis. Of the 500 patients with angina pectoris 213 are dead, with an average duration of life of 4.4 years after the onset of the disease. The average duration of life for the total series to date is 4.9 years. Death was due to failure of the heart in 82 per cent; 19 per cent had normal hearts on physical examination and normal electrocardiograms. This was looked upon as a most favourable sign. Coronary thrombosis as a complication was found not to appreciably affect the duration of life, providing the individual survived the acute attack. The presence of hypertension did not seem to be of serious import, although it had a slightly unfavourable influence on the duration of life after the onset of angina pectoris. The most vital factor in the prognosis of angina was the degree of care to which the patient would submit. The more careful his life the longer as a rule he will live. The electrocardiogram was of little help in prognosis, except that when a coronary type T-wave was found in leads 1 and 2, the patient died earlier. The prognosis was more serious when there was present syphilis, angina, decubitus, poor heart sounds, cardiac enlargement, congestive failure, or marked arteriosclerosis.

In the series of 200 cases of coronary thrombosis 100 are dead, with a duration of life of 1.5 years following the attack. The average duration for the whole series was 2.4 years. The electrocardiogram was of little help. Syphilis was rarely encountered and hypertension was of no importance. Congestive failure, poor heart sounds, and marked cardiac enlargement are unfavourable signs.

W. H. HATFIELD

An Epidemic of Chorea in a Family. Paterson, D. and Horn, I. J., *Brit. M. J.*, 1931, 2: 893.

The writers report three cases of chorea occurring at short intervals in the same family, so that all three children were suffering from the disease at the same time. All three patients were accustomed to sleep in the same room where ventilation was sufficient but uncertain. Four other children in the family were well at the time but three of them had had some throat infection at one time or another.

The observation that streptococcal diseases such as erysipelas, septicæmia, scarlet fever, puerperal fever and rheumatic fever are inclined to shew synchronicity in incidence and mortality suggests a certain epidemicity.

In the Cheyne Hospital for Children, Chelsea, it was noted that certain small epidemics of sore throat were followed two or three weeks later by epidemics of acute rheumatism and that in those cases which did not develop a sore throat a rise in temperature had been noted two to three weeks previously. Cases in these epidemics were found to be in neighbouring beds. Instances are quoted to shew that under crowded conditions tonsillitis and subsequently rheumatism may assume epidemic proportions. Three old battleships used as barracks for boys in training were greatly overcrowded. The incidence of tonsillitis was found to be 397 and of rheumatic fever 43.1 per 1,000. When the boys were transferred to land this dropped to normal proportions.

The writers' conclusions are:—(1) Chorea may assume epidemic proportions in a family where the living conditions shewed overcrowding. (2) The cases reported support the contention that rheumatism may be contagious in overcrowded conditions.

P. N. MACDERMOT

SURGERY

Aneurysm of the Splenic Artery. Lower, W. E., and Farrell, J. I., *Arch. Surg.*, 1931, **23**: 182.

Splenic aneurysms are probably the most uncommon of any aneurysms found within the abdomen. The authors present a case which occurred in a boy of 16 who was admitted to the Cleveland Clinic complaining of attacks of severe abdominal pain. Eight years previously he had had pain in the pit of his stomach following an attack of whooping-cough. These paroxysms of pain bore no relationship to the taking of food. During the six months proceeding his admission to hospital the pain occurred more frequently, and recently he had had as many as two or three attacks a day. On physical examination the abdomen was found to be slightly distended. The Wassermann and Kahn tests were negative. Much occult blood was present in the stools. An x-ray of the abdomen revealed no abnormality, while x-ray study of the gastro-intestinal tract revealed a functioning gall-bladder, a normal stomach, deformity and hypermotility of the duodenum, and a smooth and hypermotile colon. A tentative diagnosis of chronic pancreatitis was made. After admission to hospital the patient was given a transfusion of 500 c.c. whole blood.

A high caloric diet was given. The pain continued and there was no improvement in his condition, so operation was decided on. Abdominal section under spinal anæsthesia was performed. On examination of the jejunum, a tumour was discovered just above and to the left of the ligament of Treitz. This tumour was firmly adherent to the intestinal wall and to the vessels leading to the hilus of the spleen. This mass was solid and apparently attached to the spleen. On attempting to free the mass from the splenic vessels, hæmorrhage occurred, for which a transfusion had to be performed during the operation. The mass could not be dissected free from the pancreas, so the tail of the pancreas was removed with the tumour. During the dilatation of the pancreatic duct, the cut end was brought up to the abdominal incision so that there might be drainage if leakage occurred. After cauterization this duct healed. The patient made a good recovery and remained free from pain.

The pathological report on the specimen stated that "attached to the anterior surface of the pancreas (tail portion), there was a large round encapsulated mass which had been ruptured. It consisted of a sac, apparently the wall of a blood vessel, and, except for an irregular cavity near the centre, it was filled with a laminated blood clot."

The authors note that the two important diagnostic features of aneurysm of the splenic vessels are unheralded paroxysmal attacks of pain in the left side of the epigastrium and tarry stools. The pain is much more severe than that due to organic lesions of the stomach. Roentgenological examination does not demonstrate the lesion, though in one case the pulsations could be seen under the fluoroscope. A definite bruit in rarely heard over the vessel.

G. E. LEARMONTH

Gallstones in the Common Bile Duct. Judd, E. S. and Marshall, J. M., *Arch. Surg.*, 1931, **23**: 175.

A serious problem ensues both for the surgeon and the patient when there is involvement of the bile ducts due to the passage of stones from the gall-bladder into the ducts or by the formation of stones within the ducts themselves. This paper is based on a study of 1608 consecutive cases at the Mayo Clinic in which stones of the common bile duct were removed by operation. In this series there were 1,120 women and 488 men. It is interesting to note that the youngest patient was five months old. Twenty-five patients were over sixty years of age. The female patients came on an average five and one-half years earlier than the males for operation. A complete history of the patient affords the best clue for diagnosis. The chief characteristic of stone in the common duct is the history of intermittent disturbance, even though any one or all of the symptoms may be absent. Inflammatory reaction with œdema around the stone as a sequence of irritation of the mucous lining of the duct sooner or later develops; occlusion of the duct occurs causing biliary obstruction. Symptoms of sepsis appear if there is infection, and jaundice is present if the obstruction is complete enough. These acute symptoms in most instances last only a few hours or a few days, and then the attack subsides, leaving only a soreness in the right upper abdominal quadrant. Subsequent attacks become more and more frequent, with less complete relief in the intervals. Pain is commonly present and is of the usual colicky type. Eighty per cent of the present series gave a history of one or more attacks of this characteristic pain. Slightly over 17 per cent complained of a dull, boring or aching pain in the epigastrium. Jaundice was present in 1,181 (73.4 per cent) of the cases, and in 1,105 this was of the intermittent type and paroxysmal. Septic symptoms with chills and fever were present in 597 in the series and were usually associated with the colicky attacks and jaundice. Nausea and vomiting occurred in 1,100 of the cases, while the majority complained of chronic dyspepsia, with belching of gas and distress, in proportion to the amount of fatty acids and coarse vegetables consumed. By the passage of a small soft Rehfuss tube into the duodenum, it can be determined whether or not bile is passing from the duct into the duodenum. When the obstruction is caused by a stone, bile can be recovered in smaller or larger amounts. The opposite result is seen when there is total obstruction due to stricture or malignancy of the duct or of the pancreas; with the so-called "silent stone" symptoms apparently are absent. Exact diagnosis is sometimes difficult and in such cases cholecystography may be of value, especially if the result be positive.

In 1,021 of the 1,608 cases stones were found in both gall-bladder and in the common duct and in 93 of these patients there had been prior operations performed most frequently in cholecystostomy. In 587 stones were found only in the common duct. In this group 149 had had cholecystectomy performed previously; in the remaining 438 the gall bladder did not contain stones. It is the practice of the authors to explore the common duct even when stones cannot be felt, provided that it is unduly enlarged and that there is a definite history of chills, fever and jaundice. In the majority of 72 patients fistula-formation occurred after operation, situated between the gall bladder and the duodenum. Pancreatitis was present in 420 of the cases. The technique to be followed in operating for stones in the common duct is outlined. It is necessary to have good exposure of the operative field and the duct should be freed as completely as possible. Even with the greatest care some stones will be overlooked. It is important to provide for prolonged drainage by the insertion of a Deaver T-tube. The authors remove the gall-bladder in all cases of stone of the common duct when jaundice is not present or when the operative risk is not materially increased.

Post-operative treatment with one or two litres of a ten per cent solution of dextrose solution intravenously is of value, especially if the patients are jaundiced or if the liver has been considerably injured by the disease. The most frequent post-operative complications are peritonitis, pneumonia, hæmorrhage, hepatic and renal insufficiency. The mortality rate in the 1,608 patients was 6.7 per cent. Of those who recovered the great majority were completely relieved from their symptoms and have remained well.

G. E. LEARMONTH

The Diabetic Acute Abdomen. Lawrence, R. D., Millman, C. G. and Pilkington, F. E., *Brit. M. J.*, 1931, **2**: 530.

The single case reported recalls the fact that severe ketosis and acidosis in the diabetic may be associated with digestive disturbances, as nausea, vomiting, constipation, and colic. It further illustrates a fact that has received but little attention, namely, that violent and puzzling abdominal pains may occur, and the signs and symptoms simulate so closely those of an abdominal catastrophe that surgical intervention has been needlessly undertaken.

The case reported is that of a man aged 34, a known diabetic of severe type for seven years. Following a temporary state of hypoglycæmia, he became drowsy after glucose treatment, and subsequently developed most intense abdominal pain of continuous type, with generalized muscular rigidity and retraction. The urine contained a fair amount of sugar with acetone, but there was no evidence of approaching coma. Knee-jerks and ankle-jerks were absent. Even more puzzling was the presence of a polymorphonuclear leucocytosis of 51,000. The blood sugar was found to be 0.644. Under insulin (60 and 60 units), the pain disappeared, the leucocytosis dropped in 12 hours to 26,000, and the patient was discharged, recovered, in three days.

No suggestion is made as to the cause of the symdrome or the accompanying leucocytosis. In a diabetic, the decision in such a case must be made upon the patient's progress under insulin treatment.

IAN G. MACDONALD

The Pyloric Sphincter and Duodenal Ulcer. Deaver, J. B. and Burden, V. G., *Ann. Surg.*, 1931, **94**: 818.

The incidence of duodenal ulcer is increasing and preventive measures are unknown. Medical treatment controls symptoms, but there seems to be an underlying disturbance such that reactivity of the lesion will occur, once the methods of control are withdrawn.

Selected patients do well with surgery, providing the procedure also be selective. Few operations in surgery are as satisfactory as gastro-enterostomy in chronic duodenal ulcer with obstruction. In early cases the end-results from this procedure are not as good. Prolonged medical treatment means facing the hazards of perforation and hæmorrhage. The procedure of gastric resection for duodenal ulcer is open to grave doubts.

It is accepted that the stomach which develops ulcer is that in which derangement of function has antedated the appearance of ulceration. The secretory activity of the stomach is finely adjusted, both as to quantity and acid-concentration. The chief stimulus to secretion is psychic.

The main mechanism for control of gastric acidity is the pyloric sphincter, which, in co-ordination with reverse peristalsis in the duodenum, upon demand provides for regurgitation of duodenal contents into the stomach. This is mainly alkaline. Some investigators claim that such regurgitation is a natural phenomenon. The pylorus, as a true sphincter, can undergo active dilatation by means of its dilator muscle. Recent studies have shown that four-fifths of the thickness of the pylorus is composed of circular muscle.

Such a sphincter must have a double innervation for the action of a dual opposed musculature. Apparently the dilator fibres are supplied by the vagi and the constrictor fibres by the sympathetic.

Most patients with uncontrolled hyperacidity and ulcer have no duodenal regurgitation. This fault seems to lie with the pyloric sphincter. The author believes that such dysfunction of the pyloric sphincter precedes and is the causative factor of ulcer. In short, ulcer is due to the combination of hyperacidity and pylorospasm. The procedure recommended is submucosal removal of the anterior half of the pyloric sphincter, putting it out of commission. Plastic operations in which the mucosa is opened may lead to cicatricial stenosis. Thirty-five (out of forty-four) patients have been followed for 2 months to 1½ years after operation. Of these, 26 have complete relief, and 9 partial relief. The advantages of the operation are its simplicity and speed, its attempt to restore physiological conditions, without disturbance of anatomical relations and the opportunity for development of ulcer.

IAN G. MACDONALD

Management of Skull Fractures and Intracranial Injuries. Mock, H. E., *J. Am. M. Ass.*, 1931, **97**: 1430.

There is a great difference of opinion among surgeons on this subject, but the general trend is towards fewer operations. The vital point is not the fracture but the damage to the skull contents. Pulse, respiration, and blood pressure are the most reliable guides. Where there are coma and extreme shock, even the taking of x-ray photos should be held over as likely to use up strength. Undue disturbance of the patient for any purpose is unwise. Even suturing of wounds is omitted. A fixed dilated pupil suggests brain injury on that side. Fixed contracted pupils suggest

basilar injury; changes in reflexes may be the only indication of subdural hæmorrhage.

Paralysis or convulsive movements may indicate the site of hæmorrhage on the opposite side of the brain, or, rarely, even the same side in a contra-coup injury. The most serious cases show a picture of shock and this should be treated first, from the earliest possible moment by rest, heat, intravenous or intramuscular injection of saline, and dextrose. When shock is over dehydration is advised to relieve intracranial pressure. Hypertonic solutions per rectum or intravenously produce dehydration by osmosis. Many injections may be necessary. Headache and slowing pulse are the indications for renewal of this procedure. Feeding by stomach tube will prevent starvation. Where the patient does not respond to this treatment lumbar puncture is done, and if meningitis is present should be repeated many times. In very few cases is the outlook improved by operation within 48 hours. On the other hand, many if held over until the shock has been combated will stand operation fairly well. Localizing signs may be present for only a few hours, or may recur after disappearing when lumbar puncture has been performed. Persisting or recurring symptoms, such as restlessness, slowing of the pulse and respiration, relieved only temporarily by puncture, demand operation, usually at the site of fracture. Complications, such as localized traumatic encephalitis or subdural clots, may require operation too. Great care must be taken to avoid any phrase or warning that may develop in the patient's mind the idea of late sequelæ, as many obstinate neuroses come from a thoughtless remark of the attending surgeon. Prolonged rest is the best safeguard against such complications.

P. M. MACDONNELL

OBSTETRICS AND GYNÆCOLOGY

Maternal Mortality. Bock, J., *New Eng. J. M.*, 1931, **205**: 899.

On an analysis of what can be considered preventable maternal deaths we find that 71 per cent followed operative deliveries. Doctors who do maternity work should be able to distinguish more accurately between those patients who require operation and those who can be delivered better normally; they should do the necessary operations better, and they should know how to manage properly the labour of the normal cases so as to accomplish successful delivery.

The White House Committee on maternal mortality made an effort to learn if there was any difference in the maternal mortality rate in special hospitals staffed by a trained personnel, as contrasted with that in general hospitals which take maternity cases and segregate them in private wards. It was impossible to obtain sufficient statistical data bearing on this subject to draw definite conclusions, but the mortality rates at the Chicago-Lying-In, the Methodist Episcopal Maternity, Brooklyn, the New York Lying-In and the Boston-Lying-In Hospitals, all of which include an out-patient service (meaning deliveries in the homes), are lower than the general mortality rate of the locality and of the general hospital. Likewise it is shown that cases attended by specially trained personnel show both a lower morbidity and mortality rate than those attended by the general practitioner in a hospital or in a home. All doctors need not be specialists, but each doctor must know enough obstetrics to recognize the patient whose condition surpasses his qualifications to deliver and care for safely. If our pregnant women would go early and often to the doctors, our maternal mortality would be halved. Perfection of the doctor's work will care for 50 per cent of the other half.

Denmark, Norway, and Sweden have the lowest puerperal mortality, about 2 per 1,000 of live births. In these countries the midwife is a legal part of their health machinery. Many see a causal relationship between these two conditions. Not so Blair-Bell, an eminent English physician, who has carefully studied the question. He confidently believes that in these countries "the maternal mortality and disablement is low not only because of the good health of the people and hygenic conditions in which they live but also because pelvic contraction is almost unknown (pelvic contraction means operative delivery, and operative delivery means risk of sepsis), and therefore sepsis is uncommon, and because a large proportion of cases (94 per cent in Stockholm) are confined in hospital under expert obstetricians. The midwives have little or nothing to do with the question."

Every now and then some well intentioned, but unenlightened, reformer, struck by the discrepancies between the United States figures and those from Sweden and Denmark, proposes the midwife plan for us. The question was carefully considered at the White House Conference by a sub-committee. The conclusion reached was that the well-trained midwife is a poor substitute for the doctor, but better than no doctor at all. She is necessary in distant rural districts, or where a large population is too poor to support doctors. Such are some of the negro sections of the south, and the mountainous regions of the south and west. Massachusetts does not need them. There are in that State no far-lying frontiers which cannot be reached by excellent roads; there are no communities which cannot support a doctor. The problem is to see that the doctor whom they do support is a good one.

One other factor which lessens the risk of maternal death in the Scandinavian countries and in Denmark is that there contraceptive practices can be freely taught by able physicians to patients whose physical condition is such that pregnancy and labour will in all probability terminate in the death of the mother or baby or both.

LILLIAN A. CHASE

An Investigation into the part played by Maternal Syphilis in the causation of Fetal and Infant Death and the Effects of Antenatal Treatment. Pye-Smith, E. J., *J. Obst. & Gyn. of the Brit. Emp.*, 1931, **38**: 578.

In a series of 9,800 pregnant women attending Solomons Centre, 1.21 per cent were found to be syphilitic. The records of pregnancies among these women show that abortion is not more frequent than in non-syphilitics, whereas stillbirths are five times as common. Furthermore, a very large percentage of these children died of some intercurrent infection during the first year of life. When a patient is found to have a positive Wassermann reaction, antiluetic treatment is instituted at once and is continued until her last visit before being confined. Continued treatment after delivery is also urged. In women so treated, the percentage of stillbirths was reduced to 3.6.—(3 per cent being considered average), and the infant mortality during the first year of life also greatly reduced.

ELEANOR PERCIVAL

Puerperal Sepsis; The Importance of early Treatment. Hobbs, A. R., *Brit. M. J.*, 1931, **2**: 744.

The author advocates early recognition of sepsis and the early institution of treatment to reduce the altogether too high mortality rate. A temperature of 90° with a pulse of 90, an offensive lochia, or uterine colic are considered indications of inflammatory changes. These conditions may be caused in severe cases by a bacterial invasion of the placental site, but are more frequently due to interference with natural drainage. This block may be due to trauma of the uterine wall, to obstruction of a blood clot in the cervix, to a retroversion, a loaded rectum or overdistended bladder, or to an œdematous perineum. Great improvement is noted when glycerine irrigation of either cervix or uterus, given once or three times daily, is instituted early.

Regeneration of the Uterine Mucosa after Delivery, with Especial Reference to the Placental Site. Williams, J. W., *Am. J. Obst. & Gyn.*, 1931, **22**: 664.

Observations were based upon the study of a large series of uteri removed by supravaginal amputation following Cæsarean section, as well as a certain number obtained at autopsy upon women dying from other causes than infection during the first three days of the puerperium, but especially upon a series of 18 uteri obtained by supravaginal amputation at various periods throughout the puerperium.

Williams concludes that, from about the fourteenth day onward, the uterine cavity outside of the placental site is completely lined by epithelium, although several days elapse before the endometrium can be regarded as fully restored. Neither the existence of moderate infection nor the retention of fetal tissue following abortion in full-term labour seriously interferes with regeneration outside of the placental site, although it may definitely delay the involution of the latter. For the disappearance of the placental site in the normal puerperal woman, six to seven weeks are required. This is not effected by absorption *in situ*, but rather by a process of exfoliation which is largely brought about by the growth of endometrial tissue. This is effected partly by extension and down-growth of endometrium from the margins of the placental site, and partly by the development of endometrial tissue from the glands and stroma left in the depths of the decidua basalis after separation of the placenta. Williams is inclined to attach more importance to the former than to the latter mechanism, for the reason that, in many instances, the base of the placental site extends beyond the limits of the original basalis, so that obliterated arteries and thrombosed veins may lie in the inner layer of the muscularis, and consequently must be extruded before an entirely normal endometrium can be regenerated. Such a process of exfoliation should be regarded as a wise provision on the part of Nature; otherwise, great difficulty might be experienced in getting rid of the obliterated arteries and organized thrombi, which, if they remained *in situ*, would soon convert a considerable part of the mucosa into a mass of scar tissue, with the result that after a few pregnancies it would no longer be possible for it to go through its usual cycle of changes and the reproductive career would come to an untimely end. Throughout the entire process, fragments of tissue are being cast off. Few had any idea that the process continues for a month or more after the cessation of the lochia. In other words, it lasts throughout the entire anatomical puerperium.

ROSS MITCHELL

UROLOGY

Ureteral Meatotomy. Moore, N. S., *J. Urol.*, 1931, **26**: 519.

The writer is of the opinion that simple dilation is not sufficient for many cases of atresia of the ureteral meatus, and that incision must be tried. Congenital narrowing of the ureteral meatus is as definite a condition as narrowing of the urethral meatus. It is a striking picture to see a pinpoint meatus sitting on a bulging ureterocele and the relief which follows incision of the meatus is often most striking. Calculi are frequently arrested at the meatus and incision here too is most advantageous. In cases where the ureter is dilated and where there is infection above this procedure has been carried out with most favourable results. Cases are cited to illustrate its application. The special meatome devised by the author is described in detail. The question of damage to the uretero-vesical valve with consequent reflux of bladder contents has been gone into in detail, and not one instance has been

found in 75 cases, though often the bladder has been subjected to extreme filling.

N. E. BERRY

Hæmangioma of the Kidney. MacKenzie, D. W. and Hawthorne, A. B., *J. Urol.*, 1931, **26**: 205.

Two cases are reported, both occurring in males in the third decade of life. In both the symptoms were hæmaturia and pain in the loin. In one the pyelogram showed a dilated renal pelvis with distorted irregularly placed and shaped calyces, at the level of the second and third lumbar vertebrae; and in the second the middle calyx was markedly flattened. In the first the growth was situated at the upper pole, and in the second about the central portion of the kidney, and a portion of it was the seat of an infarct.

Oertel believes that these growths develop by the budding of endothelial cells from an originally normal focus, or from an embryonic faulty overproduction of blood vessels in a part. Clinically, it is difficult to explain the late symptoms, and usually the mistaken diagnosis of tumour is made. Several cases have been considered as essential hæmaturia, especially those with no great deformity in the pyelogram. It is a rare condition. The lesions are usually single and unilateral and situated in the pelvis or medulla. Nephrectomy is the only satisfactory treatment.

N. E. BERRY

OPHTHALMOLOGY

A Review of the Literature on the Etiology of Acute Iritis. Gifford, S. R., *Am. J. Ophthal.*, 1931, **14**: 100.

A discussion of the etiology of iritis has a significance now which it did not have twenty-five years ago. Then the treatment of most cases was more or less the same, regardless of etiology. Now the diagnosis of an iritis is only the beginning. Most of our efforts must be directed to a determination of the etiology, since this should be the basis for the most effective treatment.

Gifford collected in a table a number of clinical reports on iritis, arranged according to etiology. An estimate made by Arlt in 1853 is included for comparison with the more recent ones. The last series was compiled from 118 cases of acute iritis seen in practice during the last ten years. Of this number 16.9 per cent were due to lues; 8.5 to tuberculosis; 6.8 to prostatic and pelvic infection; 22 per cent to tonsils; 12.7 to teeth; 6.8 to sinusitis; 1.7 to diabetes; 32 per cent to undetermined causes. In Arlt's series of 1853, 17 per cent were due to lues; 36 per cent to tuberculosis; 21.5 to rheumatism; and 25.5 to undetermined causes.

Gifford concludes, as a result of the work of the past twenty years, that instead of having too few etiological possibilities we now have too many. In a large number of them proof has been offered of their etiological relation to iritis in many cases; they must be considered and ruled out in any case. A possible value of a survey such as this, is that a view of the relative importance of the various causes may be obtained. In cases where multiple causes are present, one may be guided by the law of probabilities in deciding which one to attack first.

S. HANFORD MCKEE

Tuberculosis in the Etiology of Acute Iritis. Finnoff, W. C., *Am. J. Ophthal.*, 1931, **14**: 127.

The scope of this paper is limited to acute tuberculous iritis and is consequently short. Tuberculosis of the iris, like tuberculosis in other parts of the body, is essentially a chronic disease. It is characterized chiefly by the formation of nodules in the iris stroma, deposits on the posterior surface of the cornea that resemble cold mutton fat, and eventually the absorption of iris pigment. The disease process is rarely confined to the iris, but is usually associated with tuberculosis of other parts of the uveal tract. He concludes that acute tuberculosis of the eye is rarely recognized as a distinct clinical entity in ophthalmic practice. The clinical appearance of acute tuberculous iritis is usually similar to acute iritis from causes other than tuberculosis, although it is likely to run a milder course. When acute tuberculous iritis occurs, it is usually an early symptom of a chronic form of the disease. Acute relapses often occur in the chronic form.

S. HANFORD MCKEE

NEUROLOGY AND PSYCHIATRY

A Contribution to the Neurophysiology of the Urinary Bladder in Man. Learmonth, J. R., *Brain*, 1931, **54**: 147.

The author has investigated this problem by observations on patients before, during, and after the operation of division of the sympathetic nerves of the bladder.

The second and third sacral are the most important spinal segments connected with the parasympathetic pathway to the bladder. An accurate origin of the efferent sympathetic fibres to the bladder cannot be given. Afferent fibres traversing the sympathetic system reach the spinal cord at least as high as the ninth thoracic segment, and probably as low as the fourth lumbar segment. The parasympathetic nerves provide motor fibres for the detrusor muscle of the bladder. All available evidence points to the hypothesis that the sympathetic nerves of the bladder provide inhibitory fibres to its detrusor muscle. Sympathetic influences act as a continuous brake on contractions of the detrusor, not merely as a bar to initiation of the contraction of the muscle. Maintenance of closure of the internal vesical sphincter depends upon its

inherent tonus, which in turn depends upon the integrity of reflex fibres in the parasympathetic pathway; the sympathetic supply merely reinforces the closure. The sympathetic pathway from the bladder is not essential for the act of micturition.

Both the sympathetic and the parasympathetic pathways contain afferent fibres which convey impulses set up by painful sensations in the bladder, and impulses giving information as to the degree of distention of the musculature of the bladder. It has been an invariable finding after sympathetic neurectomy that relief is obtained from the pain of spasmodic contraction; on the other hand, the most careful examinations have not detected any diminution in the sensitivity of the mucous membrane to tactile or painful stimuli.

FRANK A. TURNBULL

Adamantinoma of the Craniopharyngeal Duct. Frazier, C. and Alpers, B., *Arch. Neurol. & Psychiat.*, 1931, **26**: 905.

Adamantinoma and Rathke's pouch tumours form the bulk of the new growths arising from the craniopharyngeal duct. In the authors' experience the former are the more common. They report 14 cases of adamantinoma which occurred in 244 cases of sellar and parasellar lesions.

Pharyngeal duct tumours predominate in children and young adolescents. Generally speaking the endocrine picture is that of the Frohlich type. Arrest of growth and somnolence were the two commonest endocrine disturbances. Headache was a conspicuous feature in all 14 cases. One might expect papillœdema or secondary optic atrophy in all adamantinomas arising from the upper epithelial anlage, and a primary optic atrophy when the tumour arises from the lower epithelial analge. Seven cases showed primary optic atrophy, and in all but one of these the tumour presented prechiasmally at operation. The other 7 cases showed secondary optic atrophy, and of these 5 were retrochiasmal. In every case of temporal or bitemporal heminaopia the tumour at operation presented prechiasmally. The prognosis in these cases is poor. Nine patients are alive—one 13 years and one 15 years after operation. Of the remaining 5, one survived for 9 years, the rest for a matter of months.

These tumours are large—usually extending from the optic chiasm to the anterior border of the pons. Although encapsulated they are so intimately related to the structures at the base of the brain that they cannot be completely removed without causing grave injury. Most of the tumours are cystic. Microscopically, they are composed of a confusing network of epithelial columns. In typical sections the epithelial tree shows a basilar layer of columnar cells. a stratum intermedium, and a stellate layer. The basilar layer, termed the layer of ameloblasts is typical of adamantinoma, and differentiates them from the Rathke's pouch tumours which show a stratified cylindrical epithelium. Both tumours show scattered areas of calcification.

FRANK A. TURNBULL

Spinal Cord Changes in Lymphogranulomatosis. Weil, A., *Arch. Neurol. & Psychiat.*, 1931, **26**: 1009.

The author has collected from the literature 43 cases of lymphogranulomatosis in which the spinal cord had been diseased, and has added 3 personal cases. All of these cases had been studied at autopsy or operation. The involvement of the spinal cord begins at the end-stage of cases of Hodgkin's disease that may have lasted from one to eight years. Signs of a complete spinal cord lesion develop rapidly, after a short period of prodromal signs, from one to six months before death, and within a period of a few days or weeks. In 85 per cent of all the cases there was an invasion of the spinal canal by epidural lymphogranulomatous tissue. In 7 per cent which had shown paraplegia clinically, and in which there had been treatment with x-rays, only scar tissue could be demonstrated in the spinal canal, together with severe disease of the retroperitoneal and intrathoracic lymph nodes. In 2 cases there was an infectious encephalomyelitis, which could explain the clinical symptoms. In 2 cases, both boys aged fourteen, a syringomyelia was found. The dorsal segments of the spinal cord were involved in 80 per cent of all the cases, while in only 16 per cent the cervical region was affected, and in 4 per cent the lumbosacral region alone.

X-ray treatment is able to reduce considerably the size of the epidural lymphogranulomatous tissue. It does not seem likely that deep x-ray therapy will prolong life after the lymphogranulomatosis has invaded the spinal canal, except in cases in which an early laminectomy has been performed.

FRANK A. TURNBULL

HYGIENE AND PUBLIC HEALTH

The Rôle of Punctate Basophilia in the Control of Industrial Plumbism. Lane, R. E., *J. Indust. Hygiene*, 1931, **13**: 277.

Lane describes a simple technique for demonstrating stippled red cells, using methylene blue after fixation of the smears with methyl alcohol. About 100 fields are carefully searched and some 20,000 individual red cells scrutinized. The result is expressed as the number of punctate cells per million erythrocytes. A method for determining lead in air is also described in which air is passed through a Gooch crucible packed with cotton wool. After a considerable quantity of air has been passed through the apparatus the wool is extracted with hydrochloric acid and bromine. The quantity of lead recovered is determined colorimetrically. An attempt has been made to correlate the degree of punctate

basophilia with the quantity of lead recovered from the air in which the subjects worked. A close connection is apparently demonstrated. That is to say, workers in relatively high concentrations of air show high stippled cell counts and the same workers under improved conditions show definitely lower counts.

In order to demonstrate the necessity of a count of the stippled cells, 223 supposedly normal persons were examined: 122 were found to have no stippled cells; 74 showed from 100-1,000 cells per million erythrocytes; 24 from 1,000-2,000, and only 3 over 2,000 stippled cells per million red blood cells. A group of lead workers showed counts varying from 1,500 to 32,000 per million. Evidently a degree of stippling is to be found in so called normal subjects. Whether this is due to lead or not may be questioned, since several authorities have asserted that lead is found in normal urine and is therefore a normal constituent of the human body. It is the author's opinion that the size of the granules in the stippled cells is of some importance—the larger granules usually indicating an excessive and rapid absorption of lead, while the fine granules may be seen in normal subjects.

FRANK G. PEDLEY

The Problem of the Child in the Tuberculous Household. Wingfield, R. C., *Brit. M. J.*, 1931, **2**: 787.

Four principal questions are discussed in this article. (1) What is the relation of the incidence of infection, in time and intensity, among contact children (*i.e.*, children of tuberculous households) to that among the general child population? The statistics of the Brompton Hospital Research Department, which relate to the working class population of London, show that of 1,000 children, 82 per cent of the contact children and 52 per cent of the non-contact children were found infected at the age of fifteen. A closer investigation reveals that while in non-contact children the incidence increases steadily year by year from birth to age fifteen, in contact children the incidence reaches almost to its summit at a much earlier age. The rates reported from other countries differ, but agree in indicating that, in comparison with non-contact children, the incidence among contact children is much higher and infection takes place much earlier—almost reaching its highest point during the first five years of life. (2) Does the contact child run greater risk of immediate sickness or death from tuberculosis than the average child? After reviewing his own experiences and those of others in different countries, Wingfield answers this question with a strong affirmative and adds that the younger the child the greater the risk. In explanation, he favours the contention of Myers and others that the danger to the young child lies in continuous infection—at the time of most intimate contact with infected parents—when the effect of a non-lethal dose may be magnified by being received during the negative phase following a previous infection. If the infant be protected from further exposures after the first infection the prognosis need not be bad. (3) Is the contact child exposed to greater risk of future sickness or death from tuberculosis than the average child? While this question cannot be answered so definitely as the others, Wingfield believes that childhood infection exerts a protective influence, and that there is no evidence to show that the extremely early infection which is the feature of childhood exposure exerts any influence on the incidence of adult disease. There is need, however, for further investigation of the influence of infantile infection on the incidence of adolescent tuberculosis. (4) Does the contact child constitute an immediate danger to the community? Some recent investigations may, if reported results are confirmed, modify our views relative to infectivity, but for the present it cannot be said that the contact child who is not clinically tuberculous is dangerous to others.

Wingfield points out the importance of co-operation between the family physician and the health authority when there is a child in the tuberculous home. The physician must see to it that the tuberculous parent is instructed in the simple means by which infection of the child may be avoided. Continuous infection must be guarded against. The Papworth experience proves that a child may live safely in a tuberculous home. The health authority should assist by applying the Mantoux test and arranging for necessary x-ray examinations. Wingfield has a good word to say for the B.C.G. vaccine, believing that the period of immunity it provides, even though it may not last long, is "a useful weapon to tide over the dangerous period of infantile contact and exposure, in conjunction with other methods for preventing continuous exposure to massive infection." He would also like to see the tuberculin test applied to every child, and declares it should be applied to every contact child, and that every positive reactor should be x-rayed—the information gained being fyled for future information and research.

W. H. HATTIE

Observations on the Working Capacity of Coal Miners in Relation to Atmospheric Conditions. Bedford, T. and Warner, C. G., *J. Indust. Hygiene*, 1931, **13**: 252.

The correlation of working efficiency with changes of atmospheric conditions is difficult. The physician is commonly asked to define ideal conditions, but if he does so his opinion is probably not based on very reliable data.

An earlier study of Orenstein and Ireland, quoted in this article, seemed to indicate that output of work in mines was closely correlated with the cooling power of the air, as demonstrated by the kata thermometer, either dry or wet. Other observers have argued that the reading of the wet-bulb thermometer, particularly at tem-

peratures above 80 degrees F. was the important thing. The difficulty in a field study of this nature is to find an index of efficiency. Production, at first sight, might be thought to be a reliable index, but conditions of work in different mines, apart from atmospheric conditions, vary so greatly that it is not fair to compare the production of one mine with another with respect to the individual efficiency of the workers. As the result of observations in various heavy industries, it was found that the men invariably take short rests every few minutes, and that the more the work, the longer and more frequent are the rests. Consequently, the time spent in voluntary rest pauses was taken as the index of efficiency. Correlations were worked out between voluntary rests per hour of working time and such things as the dry kata and wet kata cooling power, dry-bulb and wet-bulb temperatures, etc. With respect to temperatures, both dry and wet-bulb, a positive correlation of approximately 0.2 $\pm$0.037 between temperature and rests occurred. With dry and wet kata thermometer readings the correlation was negative and of about the same order. No significant correlation occurred between relative humidity and rest pauses.

It will be seen that the association between rest pauses and atmospheric conditions is not a very close one in this study. The conclusion is that the matter could be more accurately investigated under laboratory conditions.

FRANK G. PEDLEY

THERAPEUTICS

Therapeutics and Toxicology of the Sulphocyanates. Healy, J. C., *New Eng. J. Med.*, 1931, **205**: 581.

Since 1924 more than a thousand cases of hypertension treated successfully with potassium or sodium sulphocyanate have been reported in the literature. Lodholz, in 1905, was the first to discuss the toxic effects which he ascribed to the potassium or to impurities. In 1925, Nichols reported his experience with sulphocyanates and drew attention to manifestations of intoxication with the drug. The results of toxic doses as recorded in his paper are as follows. They abolish muscular activity, stop the heart, elevate the blood pressure, cause diarrhœa, produce diuresis in rabbits, set up intense irritation of the motor cells of the spinal cord. Borg, in 1930, reported 4 cases of toxic psychosis occurring during sulphocyanate therapy. The dose in his series varied from 2 to 10 grains, three times a day. Fineberg, in 1930, concluded that sulphocyanate in 1½ grain doses failed to produce as good results as small doses of other sedatives, such as bromide or phenobarbital. Only when doses of 5 grains, three times a day were administered did he get better clinical results than with phenobarbital. Subjective symptoms were more improved under sedative treatment, while the fall in blood pressure was greater with larger doses of sulphocyanate.

The author reports 4 cases treated with sulphocyanate. The first case had a fall in blood pressure of 30 mm. but became disoriented, had hallucinations of sight and hearing, and was at times maniacal. Morphine and scopolamine were required to control the excitement. In the second case the blood pressure declined gradually and the patient became markedly weak and drowsy, then comatose, with a pressure of 102; she showed areas of pigmentation in the mouth and on the flexor surfaces of the elbows. Ever since then she has required daily hypodermic treatments with epinephrine. The third case died in coma, as did the fourth. The author then carried out experimental work on rabbits, from which experimental work he concludes that the drug probably accumulates in the adrenal glands.

His conclusions are. The sulphocyanates in doses large enough to reduce blood pressure appreciably are toxic and may destroy life. The syndrome of hypoadrenia has been produced clinically and experimentally with what have been described as therapeutic doses of sulphocyanate. The drug is cumulative under certain conditions. Other symptoms of intoxication, such as gastro-intestinal weakness, rash, dermatitis, psychosis, may be manifestations of hypoadrenia. The incidence of intoxication increases with the age of the patient.

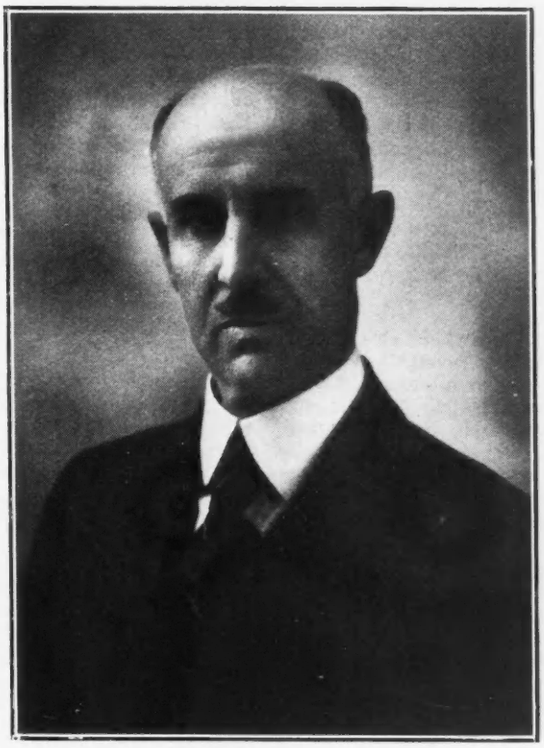
LILLIAN A. CHASE

A REMEDY FOR STATIC MINDS.—Things in nature rarely are static; they increase or they decrease; they grow or they decay; they progress or they retrogress. Man's education in many respects resembles things of nature; rarely is it static; when knowledge does not increase, almost always it decreases. Physicians should remember this and make every effort to keep out of the static state and on the side of increase, of growth, of progress. Physicians can be divided into two great groups, those that are learning and those that are forgetting; those that each year know more, and those that each year know less. There seems no third group, those that are stationary. A few physicians increase in knowledge from within and grow from their own doing. These are the innate investigators. The rank and file require outside help to grow and to progress. Books, meetings, contacts, discussions, teachers are our armamentarium for progress. Like the "spring tonic" of past days, all of us need some of this medicine, at least annually, better if it comes more frequently. A large majority of physicians know their need and seek treatment.—Dr. Henry A. Christian.

Obituaries

Dr. William Harop Hattie. It is with the greatest regret that we have to chronicle the death of Dr. William Harop Hattie, of Halifax, N.S., which occurred suddenly on the night of December 4, 1931. Doctor Hattie had been suffering from chronic arthritis for some two or three years, a painful and disabling condition which he bore with patience and resignation, but which must have undermined his formerly excellent constitution; his death, however, from a heart attack, was unexpected.

Doctor Hattie was born in Pictou, N.S., on July 27, 1870, a son of George Hattie and Agnes McKean Hattie. He was of Scottish extraction, the name having been originally McHattie. He made his preliminary studies at the famous Pictou Academy, which has given so many distinguished graduates to Canada, and later went to McGill University, where he received his M.D., C.M., in 1891. Being under age at the time, he had to wait some months before he could be legally qualified. Immediately after his return to Nova Scotia he became attached to the staff of the Nova Scotia Hospital, then under the superintendency of Dr. A. R. Reid and shortly after under that of Dr. George L. Sinclair. Doctor Hattie himself became Superintendent of the Institution in 1908 and retained the office until 1913, when he became Provincial Officer of Health. He resigned this post in 1922, to become more closely associated with Dalhousie University, as Professor of Hygiene and of Mental Diseases and, eventually, Secretary of the Faculty of Medicine and Assistant Dean.



Dr. William Harop Hattie

Doctor Hattie was identified with many organizations, among them the Rotary Club, the North British Society, the Council of Mental Hygiene, and the Brightwood Golf Club. He was a member of the Halifax Medical Society, the Medical Society of Nova Scotia, the Canadian Medical Association, the Royal Institute of Public Health, the Canadian and American Public Health Associations, and the American Psychiatric Association. In all of these he took an active interest. He was also a Fellow of the lately constituted Royal College of Physicians of Canada.

On July 22, 1897, Doctor Hattie married Miss Eva Merkle Grant, daughter of Mr. and Mrs. J. Fisher Grant of New Glasgow, N.S., and to them were born two sons, John Stewart and Grant Murray; and one daughter, Mrs. Charles Moffat. Mrs. Howard Murray is a sister and Mr. R. M. Hattie, a brother, both of Halifax.

Few men were so well known throughout Nova Scotia as Doctor Hattie. His prominence in institutional work, and the fact that for years he was Registrar of the Provincial Board of Nova Scotia, brought him into close contact from time to time with all the medical men of his province. As an active worker, too, in connection with medical societies of national scope he became a familiar figure in all parts of Canada. Tactful, courteous, and far-seeing, Doctor Hattie was enabled, often in the face of opposition and discouragement, to bring about reforms in connection with the medical and social life of his province which are bearing good fruit to-day. Notably, is this the case in connection with the care of the insane. No movement having in view the betterment of the people around him ever lacked his enthusiastic support.

Doctor Hattie was a thoughtful, pleasing, and prolific writer, and was a valued member of the Editorial Board of this *Journal*.

A Halifax daily paper, in noticing, editorially, Doctor Hattie's death, paid him a well-deserved tribute, of which we may quote the opening and closing paragraphs.

"Nova Scotia has had few men more prominently and helpfully connected with the development of medical science and mental hygiene in this province than Dr. W. H. Hattie, whose sudden passing is so deeply deplored by a wide circle of friends and acquaintances within and without the medical profession. . . .

"Devoted to his calling, a loyal member of his church, a diligent student thoroughly conversant with the most recent developments in medical science, Doctor Hattie possessed a singular charm of manner, and his brilliant gifts enabled him to render valuable and fruitful service to the causes he had at heart. A Christian gentleman, the soul of honour, Doctor Hattie's life and achievements have been of incalculable worth to his native province; his influence and the fragrance of his memory will long abide."

An Appreciation

In the death of William Harop Hattie, Nova Scotia has lost a valuable public servant. His work in general public health administration, in guidance toward health of those mentally sick, in supervisory control of those convicted of crime, in custodial care of the indigent, and in leadership in the newer methods of medical teaching has, perhaps, not been fully appreciated by his fellow citizens and medical co-workers.

Although a public servant the greater part of his professional life, Doctor Hattie never lost that gentleness of manner and manifestation of human sympathy so apt to be submerged in those who for many years deal constantly with officialdom. A hard worker and close student, he habitually carried a burden too great for one whose health had long been seriously impaired. A good nature and marked versatility led him to be drafted for extra teaching over a long period of years; conscientious preparation for this work kept him in his study in Dartmouth each night long after his fellow workers had sought repose.

The gentleness of manner that unfitted Doctor Hattie for political strife was most evident in his family life, which was ideal, except that he worked too hard because of the many activities thrust upon him. He never forgot his duties as a citizen; hence he took an active part in local affairs in Dartmouth, his home, where he maintained faithful church affiliations, served as a

school director, worked for community betterment, and was loved as a neighbour.

The teaching experiment that best showed Doctor Hattie's vision was not developed to its logical conclusion because of his failing health. In his positions as Professor of Hygiene and Public Health at Dalhousie University and as Medical Director of the Public Health Clinic, Doctor Hattie initiated an entirely unique plan to fit medical students to be family practitioners. Under his direction, medical students were required to make environmental studies in the homes of patients seeking medical treatment or public health guidance. The home visit of the student was used as a sort of laboratory "check-up", in which the theories learned in the course on hygiene and preventive medicine were practically applied, and this work, when fully reported to the Professor, determined the student's final grade in this branch of medicine. Only one other medical school in the world, and that in China, has adopted such a practical method of fitting the student-physician to be a real home adviser in all matters pertaining to health.

It remains for Doctor Hattie's successors to carry on this experiment as he would have desired, and to watch the effect on the younger generation of practitioners of medicine as they take up their life work throughout the Maritime Provinces.

B. FRANKLIN ROYER,
New York.

Professor Wilfrid Derome. The whole of Canada has learned with deep feelings of the death of Dr. Wilfrid Derome, Director of the Laboratory of Legal Medicine and Police Technique of the Province of Quebec, Professor of Legal Medicine in the University of Montreal, which occurred on November 24, 1931.

The distinguished personality of the master who has gone, his life of labour, equable and devoid of ambition, the great love which he bore for his pupils, combined to make him an amiable and striking figure in the eyes of those who, like us, had the advantage of his acquaintance; to approach Doctor Derome was to love him. He died in his beloved Notre Dame Hospital where he had been chief of the laboratory for so long. His death is not only a sad loss to Canada but to medico-legal science which he had all his life cultivated so earnestly. May we be permitted to recall in the columns of this *Journal* the scientific career of our regretted master. We shall do so briefly.

The man of science, Dr. Wilfrid Derome, was born at Napierville, Que., in 1877. After completing his higher classical and university courses he obtained the diploma in medicine of Laval University of Montreal (1902). On leaving the University, he looked for his path for some time; he was successively interne at the Notre Dame Hospital, pathologist, practitioner; some years later we find him in Paris, specializing in legal medicine. After a brilliant course of studies, under such masters as Thoinod and Balthazard, he obtained the diploma in legal medicine and psychiatry, and returned to his own country where, from the time of his arrival, he placed his knowledge and his splendid intellectual and moral qualities at the service of Justice.

If Medicine is as old as pain, and, consequently, as old as the world, one cannot say as much of legal medicine, since, according to its very definition, its existence implies an organized and regulated society. However, in Canada, until about 1910, medico-legal science had never followed the progress of legislation. Cultivated with care in European countries, it was here and in the whole of North America neglected, if not unknown. The experts, for the most part surgeons, had not reached the summit of their calling. Also, the lawyers paid but little attention to legal medicine; they thought it could be professed by men having no special competence. It was the great merit of Doctor Derome that he thoroughly individualized and delimited legal medicine in Canada. He created the laboratory of legal medicine, and his careful methods of observation and experimentation, until then unemployed, as well as his consultations, soon attained great renown and became authoritative. By his knowledge and his scrupulous honesty, he inspired great confidence in the magistrates; with the requisite scientific precision he excelled in disentangling the true from the false in difficult cases. But with a spirit ever bubbling over with activity Professor Derome wished to do more, and give to his contemporaries as well as future generations the benefit of his practical experience. Accordingly, he published in 1920 a "Précis de Médecine Legale", with which all physicians and lawyers were acquainted and which they consulted with profit. This treatise was a model of clearness and accuracy. In 1929 he published another work, "Expertise en Armes à feu", which had a preface by Balthazard, Dean of the Faculty of Paris and Professor of Legal Medicine. This book was quite a revelation to the outside world, and at one bound placed its author among the foremost technical experts of the world and the Medico-legal Laboratory of Montreal at the head of all such institutions in regard to the science of ballistics. Besides these two volumes and a second edition of his "Précis de Médecine Legale", which he was completing when death overtook him, Doctor Derome had published numerous articles on his specialty in *L'Union Médicale du Canada*, of which Journal he was a director, in the *Annales de Médecine Legale de Paris*, of which he was a correspondent, and in the review, *Police Science*, of Chicago, of which he also was a correspondent.

Doctor Derome was the first consultant of his time in medico-legal questions. There were few cases of this kind on which his advice was not sought. In connection with famous trials which gave him an opportunity to study the most important points in legal medicine he wrote reports and opinions which are models of their kind. Titles could not have added to his glory. His splendid researches will suffice to immortalize his name. He was the first in Canada to understand the social importance of legal medicine, of which he was a true pioneer, and to the study of which he applied scientific and experimental methods until then unknown. His theories, then, outgrew the narrow confines within which the medico-legal doctrines of his time were imprisoned.

The record of time will be needed to appreciate at his real value this great and splendid figure, of perfect scientific probity, this humble and modest savant who justly received the deferential regard of scientific men throughout the world.

He has gone, at the age of fifty-four years, and in full intellectual vigour, to a greater justice than that he served, leaving behind him, as a silvery track, a long series of fertilizing endeavours.

ROSARIO FONTAINE

Dr. Joseph B. Gallagher, of Montreal, died on November 25, 1931, after a prolonged illness.

Doctor Gallagher, a native of Bath, N.B., graduated from McGill University in the class of 1910. In 1913 he went to British Columbia, acting as physician and surgeon in a great railway construction undertaking until 1916, when it was terminated. He then enlisted in the Army Medical Corps and served overseas.

After the war he returned to Canada, studied for another period at the Manhattan Eye, Ear and Nose Clinic, and then went into private practice, associating himself with the Montreal General Hospital. In 1929 he did post-graduate work in London, Berlin, and Vienna.

One brother, Charles Gallagher, and two sisters survive him. The brother and one sister are resident in Bath, N.B. Doctor Gallagher was unmarried.

Dr. Charles Westlake Hoare, of Walkerville, Ont., died at his home on November 10, 1931. Born near Strathroy, Ont., he came to the Border Cities in 1890 after graduating from McGill University (1888). His interest in public affairs was manifest over a long period and at various times he was president of the Border Chamber of Commerce, chairman of the Essex Border Utilities Commission, head of the Essex County Medical Society, and chairman of the Governing Board of Metropolitan General Hospital, Walkerville. Doctor Hoare was also a former Mayor of Walkerville, and a former chairman of the Walkerville Board of Education, as well as of the Public Library Board.

He is survived by his widow, a daughter, Mrs. (Dr.) Gordon Little; a brother, Edward, and a sister, Miss Georgiana Hoare, all of Walkerville. His only son, Lieut. Walter Hoare, was killed in France during the Great War.

Dr. Rosario Labrecque, of Saint Casimir, Que., died unexpectedly on November 11, 1931, from cerebral hæmorrhage at the early age of forty-two. He was born at St. Charles de Bellechasse, and had studied at the Seminary of Quebec and Laval University. He had practised about twenty years at Saint Casimir.

Dr. James McCumming Potts died suddenly on November 13, 1931, at his home in Stirling, Ont., after a brief illness. Doctor Potts was a son of Mr. and Mrs. Edward Sydney Potts, of Perth, and was educated at Trinity College School, Port Hope, graduating later from McGill University (1888). He married Miss Minnie Faulkner, daughter of Dr. Faulkner, and had practised in Stirling for some twenty-nine years. Surviving him are his widow and one son, James Edward Potts, a student at McGill University.

Dr. Albert Edward Stutt, late of Toronto, died at the residence of his brother, West Flamboro, on November 13, 1931. He was a graduate of Trinity University, Toronto (1881), and held the L.R.C.P. of Edinburgh (1881).

Dr. William I. Taylor. A distinguished medical career was ended by the death, recently, of Dr. William Taylor, who passed away in Port Credit in his fifty-sixth year. Doctor Taylor was an honour graduate of Trinity Medical College (1898). Following his graduation, he engaged in advanced work in London, and in 1900 received an appointment in the British West African Medical Service. He served in Lagos, Southern Nigeria and at Calibar, West Africa. At the time of his retirement in 1922, he was Principal Medical Officer of Sierra Leone. In the year 1918 he married Ida Helene Smith, of Toronto. He served as medical consultant with the British forces in West Africa during the Great War. Three brothers survive: Dr. Walter H. Taylor, Colonel Allan E. Taylor and Dr. Norman B. Taylor; and two sisters, Mrs. F. D. Bayley and Mrs. Beverly Heath, of Toronto.

Dr. Edward J. O. Walcott, of Lachine, Que., died in the Lachine General Hospital on November 29, 1931, after an intermittent illness of two years. He was in his 48th year.

The doctor was born in Barbados, B.W.I., and came to Canada to take up a medical course at McGill University in 1907. He graduated in 1912 and joined the staff of the Montreal General Hospital, where he remained for a year. He later went to other hospitals in Montreal.

In 1914, Dr. Walcott started practising in Lachine, and within a few years, through his genial temperament and untiring efforts he established a reputation for himself not only in the municipality but in the surrounding district.

During the years that he served the citizens of Lachine, Dr. Walcott was connected with the Lachine General Hospital, and was secretary of the medical board as well as member of the general board.

Dr. Frank Zwick (M.B., Toronto 1890), died suddenly at his home, Stirling, Ont., on December 6, 1931, in his seventy-second year.

News Items

Great Britain

The British College of Obstetricians and Gynæcologists.—The first annual dinner of the British College of Obstetricians and Gynæcologists was held at Grosvenor House, London, on October 23rd, with the president, Professor W. Blair Bell in the chair. The dinner was preceded by a special meeting of the council for an academic ceremony, when Professor Paul Bar of Paris and Professor Essen-Möller of Lund, Sweden, and Lord Riddell were made Honorary Fellows of the College. The ordinary Fellowship was also conferred upon seven recipients, and seven others were admitted to Membership.

Addressing Professor Paul Bar in French, the President said that his great services to the cause of obstetrics and gynæcology had gained for him the homage of womankind and the admiration of the entire world. To Professor Essen-Möller, after a few words in Swedish, he said that those who had visited the beautiful clinic in the quiet mediæval city of Lund had come away enchanted and enriched. To Lord Riddell the president expressed thanks on behalf of the College for much help, and spoke of the many years during which he had devoted time and resources to further the advance of medical science.

The French Ambassador and the Swedish Minister were present at the ceremony, and, addressing them, the president said that science knew no boundaries, and by the conferment of Honorary Fellowship on distinguished men in France and in Sweden the truth of this had been again demonstrated.

The French ambassador (M. Fleuriau) returned thanks on behalf of Professor Paul Bar. It was the more fitting, he said, that Professor Paul Bar should have been chosen for this honour, because fifty years ago he had been a student in England. He hoped that his election would further the liaison between the specialists of France and of England.

The Swedish Minister (Baron Palmstierna) said that this distinction would be greatly appreciated in Sweden, where Professor Essen-Möller bore a great name and had created a large school of followers.

The dignified ceremony concluded with the words of exhortation spoken by the president, "*Super ardua consurgamus.*"—*Brit. M. J.*, 1931, **2**: 815.

The Osler Club.—At a meeting of the Osler Club, held on October 27th, Mr. W. R. Bett gave an address entitled "The thyroid: conquests, failures, mysteries, and men," in which he traced the very early recognition of goitre in the literature, sketched the evolution of treatment, and told its operative story through the lives of pioneers such as Kocher, and Halsted. He linked up the researches of Col. McCarrison with the belief of Pliny that goitre was caused by impurities

in the water supply, and dealt at some length with W. H. Gaskell and his "Evolution of the vertebrates." The discussion was opened by Sir Walter Fletcher, Secretary of the Medical Research Council, who was followed by Mr. T. P. Dunhill, Prof. Francis R. Fraser, Dr. G. Scott Williamson, Mr. Geoffrey L. Keynes, Prof. Leonard Findlay, Mr. K. J. Acton Davies, and Mr. J. Paterson Ross. An exhibition was arranged of photographs and cartoons of thyroid pioneers, and of books and papers on the subject.

Alberta

The Department of Chemistry at the University of Alberta has been conducting a series of analyses of water to determine the iodine content and has found in some specimens that there was only 20 per cent of iodine sufficiency. The travelling clinic of the Provincial Department of Health in 1929 found that there were certain districts where 18 per cent of the public school children had goitre. The Provincial Department of Health is calling the attention of medical officers of health to the fact that tablets containing iodine are furnished by the Department. School Boards should give the matter thought and see that a physician is called in to treat this class of cases.

During the month of August last, the Calgary city council received a request from the unemployed Ex-service Men's Association that the necessary steps be taken to have the proper authorities adopt some contributory scheme whereby free medical attendance and hospital treatment may be available for everyone. Alderman Fred. White, President of the Federation of Labour of Alberta, suggested that free clinics be established for the indigents. He did not state that the physicians of the city were refusing treatment but that they were giving free treatment to many, which constituted an unfair burden. A formal request was made by the city council to the Hon. George Hoadley, Minister of Health for the services of the "travelling clinic". He replied that the travelling clinic was organized to take care of those in outlying districts where the services of physicians were not available and not for the larger centres. Dr. D. Gow, medical officer of health for Calgary, was asked to submit an estimate of the cost of taking care of the city's indigents with their families. He estimated that there are about eight thousand who would come under this scheme. It would require the services of eight doctors, eight dentists, and eight nurses. Allowing the doctors $2,500.00 a year each and the dentists $2,000.00 a year each and $1,200.00 for each nurse (amounting to $9,600.00 for eight nurses). With office expenses the scheme would cost $55,200.00. As Dr. Gow remarked "No doctor is going to outfit an office or supply such equipment unless guaranteed continuity of his position. Who can guarantee that? This department is not aware of any cases suffering for want of medical, surgical or dental care, nor has there been any complaint to us. The medical men are doing this work with little and in many cases no hope of remuneration."

The city council communicated with the Calgary Medical Society asking if the members were in favour of this plan. When this had been discussed it was decided to inform the city council that as the physicians of this city had always in the past given their services to those who were in need of medical care so during this stressful period would they continue to do so. They were not in favour of the free clinics.

Notwithstanding the fact that the revenues at the Calgary municipal hospitals for the first nine months of this year have not been up to expectations, yet the charge to the mil-rate is $88,511.05, a decrease of more than $4,000.00 compared to the charge to the mil-rate for the same period last year. Revenue for the first nine months totalled $122,293.91 and expenses $210,804.96. The difference in these two amounts represented the deficit in operations this year to the end of September. In 1930 the charge to the mil-rate at the end of nine months was $92,789.95. In 1929 it was $67,302.21. While the deficit in 1928 was $68,490.06 and in 1927 $67,337.03.

At the commencement of this year the commissioners estimated that the revenue would be $180,770.00 and the expenditures $306,005.13 leaving an estimated charge to the mil-rate of $125,235.73 for the year. During the year 1930 the charge to the mil-rate totalled $114,286.47.

Valuable lands and buildings have been donated for the Shriner's Hospital for crippled children in Calgary. As soon as sufficient funds have been accumulated the hospital will receive patients. The requirements for admission are that the parents of the child requiring treatment must be unable to pay for hospital care. The child must be under fourteen years of age and there must be a reasonable chance of benefiting the patient. These will be the only stipulations and questions of race, colour or creed will have no bearing.

G. E. LEARMONTH

British Columbia

The Annual Dinner of the Vancouver Medical Association was held at the Hotel Vancouver, on November 14th. The Committee in charge very wisely had reduced the price of the tickets in view of the prevailing depression, and its wisdom was attested by the attendance, which was the largest on record, 166 men being present. The program went with great smoothness and everyone appears to have had a good time. A particularly pleasing feature was the presentation to Dr. A. P. Procter of the "Prince of Good Fellows Degree" and from expressions of opinion heard on all sides no more suitable choice could have been made by the Executive, nor one more gratifying to the members at large. Dr. H. H. Pitts and his committee are to be congratulated on the success of the dinner.

Pari passu with this event there was in progress a very successful dinner and whist drive at the Georgian Club arranged by the doctors' wives, with an attendance of eighty.

Dr. A. W. Hunter was chosen President-Elect of the Western Branch of the American Urological Association at the Seventh Annual Meeting in San Francisco. The 1932 meeting will be held at Portland, Ore., July 1 and 2, 1932.

The formation of a metropolitan board of health, embracing the municipalities of the lower mainland and Fraser Valley, is proceeding. Dr. E. W. Covington, representing the International Health Division of the Rockefeller Foundation, recently addressed meetings of interested bodies. Doctor Covington stated that the Foundation has never made a practice of assisting city health departments, but would, while the value of such a board was being proved, assist suburban muncipalities to the extent of one-quarter of their outlay. The proposed scheme would, under present plans, provide for the services of four full-time doctors, six full-time nurses and two sanitary inspectors.

The Royal Commission to investigate chiropractors and other cults commenced its sittings on November 30th. Opening proceedings were concerned with discussions as to the scope of the enquiry.

Several irregular practitioners were recently convicted in the Vancouver police court upon charges of illegally using the title "Doctor".

The annual meeting of the North Pacific Surgical Association was held in Vancouver on December 4th and 5th, under the presidency of Dr. P. A. McLennan. At a meeting on the evening of the 4th, open to the profession, Prof. Wm. Boyd, of Winnipeg, spoke on recent knowledge of brain tumours. This meeting attracted a large attendance from the surrounding centres.

With a view to improving statistics in relation to still-births the Provincial Board of Health has adopted the rules laid down by the Committee of the League of Nations. C. H. BASTIN

Manitoba

The Children's Hospital has received tenders for an addition, one storey in height, which will be erected on the basement and foundation located at the west side of the hospital. The estimated cost is $40,000. The addition will be built so that other stories may be added in later years. It will be occupied by the out-patient department and various clinics, and will also contain a general waiting room, admittance and casualty wards, exercise room, waiting room, and rooms for consulting, dietitians, dentists, dispensary, skin treatment, eye, ear, nose and throat services, autopsies, sitting room for doctors, and a chapel.

The Union of Manitoba Municipalities, at their annual meeting, held early in December, requested the Provincial Government to relieve the municipalities of the care of hospital expenses of indigent persons by a scheme of State taxation. The resolution requested the Provincial Government to appoint a supervisor at each hospital to say whether a patient be allowed to remain in the hospital or not, and further requested the Government to assume all responsibility for admitting and discharging them from the hospitals.

A. T. Cameron, Professor of Biochemistry, University of Manitoba, has been elected President of the Canadian Institute of Chemistry. ROSS MITCHELL

New Brunswick

At the Executive meeting of the New Brunswick Medical Association, held this month in Fredericton, a special committee was appointed to appear before the local government to press further the necessity of early action in the establishment of a cancer clinic for the treatment of malignancy both for indigent patients and for those who are able to pay. This matter has received consideration at recent medical meetings and it is hoped that some early action may be taken.

Dr. J. P. McInerney, of Saint John, was recently elected chairman of the local branch of the Red Cross in Saint John.

Dr. G. G. Corbet was this month re-elected the Provincial President of the Saint John Ambulance Association.

The funeral of the late Dr. Joseph B. Gallagher took place at Bath on November 28th. Dr. Gallagher was born in Johnville and although practising in Montreal at the time of his death, yet it was to New Brunswick that he looked as his birthplace and to which his body was returned for burial. His friends in New Brunswick join with his colleagues in Montreal in expressions of regret at his death and praise of his work in his chosen specialty.

It has been announced that Dr. S. R. D. Hewitt, lately of Regina, is to accept the appointment of medical superintendent of the Saint John General Hospital on January 1st.

The sympathy of the medical profession in New Brunswick is extended to Dr. R. T. Hayes, of Saint John, on the occasion of the death of his father, R. T. Hayes, on December 2nd. A. STANLEY KIRKLAND

Nova Scotia

The new building of the Halifax Infirmary has progressed so far that work on the interior is now well under way. The exterior presents an imposing and architecturally pleasing appearance.

The corner stone of a new gymnasium building for Dalhousie University was laid, with appropriate ceremony, on November 10th, Mr. Hector MacInnes, senior member of the Board of Governors, officiating. The new building is to replace the structure destroyed by fire some months ago, and is to include features which will make it adaptable to other than gymnasium purposes. Architecturally it will harmonize with the other buildings on the campus.

The new Tuberculosis Annex of the Memorial Hospital, Inverness, was formally opened on November 25th. This is the first of the general hospitals which are cooperating with the Ministry of Health in providing special accommodation for tuberculosis patients to complete building operations. The event was marked by a largely attended dinner, at which speakers included Hon. Dr. Murphy, Minister of Health, several representatives of his department, and the physicians of Inverness.

The fifty-ninth annual meeting of the Provincial Medical Board of Nova Scotia was held at Halifax on November 13th, when exceptionally satisfactory reports were presented. From the financial point of view the most successful year in the history of the Board was recorded. Dr. J. G. MacDougall was re-elected *President*, and Dr. W. H. Hattie, *Secretary-Treasurer and Registrar.*

The annual meeting of the Soldiers' Memorial Hospital, Middleton, was held on December 2nd. Although a small deficit was reported on the year's work, the reports generally were regarded as highly encouraging. Hon. Dr. Murphy, Minister of Health, was in attendance, and spoke on the part of the small hospital in the community. Dr. A. McD. Morton, of Halifax, who was present, was called upon and made a brief address.

At the graduating exercises of the training school of the Victoria General Hospital, held on November 26th, twenty nurses were awarded diplomas. The graduates were addressed by Dr. Hugh Schwartz. The chairman of the Board of Commissioners, Mr. O. E. Smith, made a fitting reference to the loss the hospital sustained in the death of Hon. George E. Faulkner, who was chairman of the board for several years, and Mr. W. W.

Kenney, who was superintendent of the hospital for a long period. A tablet in memory of Mr. Kenney, the gift of the American Hospital Association, was unveiled by the Honourable, the Chief Justice, and Rev. Mr. Huddleston gave a short address in which his late parishioner, Mr. Kenney, was highly eulogized. Among those taking part in the proceedings was Dr. George A. MacIntosh, the present superintendent of the hospital.

At the annual meeting of the Halifax Children's Hospital, held on November 10th, very excellent reports were presented. During the year approximately $110,000.00 was expended on construction and renovation. The new nurses' residence was completed, and quarters formerly occupied by nurses in the hospital building were remodelled and made into small wards for patients. A very fine new operating room was provided, the equipment of which includes a Balfour operating table and an Operay multi-beam electric light fixture. The hospital now has accommodation for 90 patients, and could receive 100 should it become necessary. The medical board reported an usually busy and successful year. All present at the meeting were greatly pleased to see Mr. O. E. Smith back in his presidential chair, looking very well after a long and serious illness.

Dr. Kenneth M. Grant, who graduated in Medicine at Dalhousie in 1929, has been awarded a Rockefeller grant to enable him to pursue special study in obstetrics and gynæcology and has left for Chicago where he will carry on work under the guidance of Dr. DeLee.

Dr. Donald Mainland, Professor of Anatomy at Dalhousie University, has been made the recipient of a grant from the Banting fund to assist him in the further prosecution of a study of nuclear and cell measurements of certain tissues in which he has been interested for some time. Dr. Mainland feels that a proper statistical analysis of his measurements will disclose information of much practical value.

Mr. B. Evans Parry, consultant architect of the Department of Pensions and Health, Ottawa, was in Halifax on December 3rd, and discussed with the Provincial Department of Health plans for a tuberculosis annex at the St. Martha's Hospital, Antigonish. On the following day he went to Antigonish to meet the Minister of Health and the hospital authorities.

W. H. HATTIE

Ontario

At the annual meeting of the Essex County Tuberculosis Sanatorium, Dr. G. R. McNeely reported 123 patients in residence at the end of the year, with every bed filled. The lack of beds necessitated the sending of ten cases elsewhere for treatment. A waiting list of about thirty was also reported.

The City of Hamilton is making a large expenditure on the addition to the out-patients' clinic at the General Hospital.

On November 18th, there was dedicated, at the Welland County General Hospital, the new children's ward,—the gift of the Welland Rotary Club and the Port Colborne Lions Club. This will provide a much needed opportunity for special pædiatric work.

The City of London, Ontario, is to be congratulated on its bravery in launching a million dollar campaign for the hospital, in this period of depression and immediately before Christmas. The success of the campaign seems assured.

Six or eight toxoid centres for the immunization of pre-school children have been opened in the City of Toronto. This is the beginning of the campaign of the Department of Health against diphtheria.

The Ontario Government has decided to grant the City of Ottawa $40,000, to permit completion of the Whitney Memorial Building of the Royal Ottawa Sanatorium, and to make other improvements that will meet the demand for more accommodation for tuberculous cases.

On November 9th, the corner stone of the new Nurses' Residence at the Home for Incurable Children, Toronto, was laid. When the building is completed, excellent accommodation will be provided for the staff of eleven nurses and supervisor, in addition to a large recreation room for the children.

Approximately 500 milligrams of radium, valued at $43,000, has been received recently from Belgium by the Toronto General Hospital, for the treatment of cancer cases. This is the largest shipment brought into Toronto to date, and, probably, the largest in Ontario. The radium owned by the hospital, including this new supply, is now valued at $90,000, which will enable the hospital to take care of its immediate needs, based upon the number of cases they have been receiving.

A great deal of interest is being manifested in the trip to England which is planned by the Canadian Medical Association, to attend the Centenary of the British Medical Association. According to plans now made, the party will leave Montreal by the *Duchess of Atholl* on July 2nd, after the annual meeting of the Canadian Medical Association and Ontario Medical Association which takes place in Toronto during the week of June 20th. A very attractive itinerary has been arranged for this trip.

At a recent meeting of the Thunder Bay Medical Society, Dr. T. C. Routley, Secretary of the Ontario Medical Association, was unanimously elected Honorary President of that Society for the ensuing year.

J. H. ELLIOTT

Quebec

The attending staff of the Montreal General Hospital held their first annual dinner at the Windsor Hotel on December 12th. Dr. C. A. Peters, the president of the Medical Board, was chairman. He said that he hoped this would be the first of a series of such dinners stretching into perpetuity, and judging by the success of the occasion, (in which the hand of Dr. H. Little could be clearly discerned) there seemed to be every prospect of his hope being fulfilled.

Dr. H. A. Lafleur gave the toast to the Montreal General Hospital. He said that he had been associated with the hospital over a long period, and had watched its growth both in number of beds and in its teaching and laboratory equipment. He spoke of its long and unbroken service to the poor of Montreal, irrespective of race or creed, and he considered that the work of the staff in every respect gave it a rank not inferior to

that of any other hospital on this continent. But efficient management was a *sine qua non*. There had always been financial difficulties, and the hospital had always been peculiarly fortunate in the men who assumed the duty of dealing with these. The roll of those who for the past century and more had guided the hospital through its vicissitudes was a long and distinguished one. It was really a cross-section of the business life of Montreal. It was entirely fitting and to be expected that there should be present as guest and president of the board of governors one of the members of the family whose name had been so long and so closely associated with the hospital, Colonel Herbert Molson.

Colonel Molson spoke briefly on the management of the hospital, and outlined the circumstances which tended to produce expansion but which were hampered so continually by financial considerations. As might be expected, the present stress and uncertainty of business affairs was a weighty determining factor in all the plans and decisions of the management. But his views, while sobering, were not depressing. He commented with special emphasis on the perfect cooperation between the medical board and the board of governors, a condition of things which lightened to an indescribable extent what was always a heavy burden of anxiety.

Dr. A. T. Bazin gave a short and extremely interesting account of the history of the hospital, laying particular stress on the part given in the hospital activities to the teaching of medicine. This had been recognized and designated in the hospital charters as one of the obligations of the institution. It was hardly necessary, he said, to point out how consistently and ungrudgingly this obligation had been and was being met by the staff of the hospital; still less was it necessary to more than remind his audience of the long line of notable men who had added lustre to the name of the hospital by their work and teaching there.

Dr. Bazin's reference to teaching was aptly developed by the speaker of the evening, Prof. F. Clarke, of the Department of Education at McGill University. Prof. Clarke showed lucidly and convincingly how essential it was that the teacher should understand something of the technique of teaching. The man was rare who could teach well without some more or less definite analysis in his own mind of how to produce the best effects on the minds of his students. It was admitted that the technique of teaching could be made too elaborate to be really effective, but there were underlying principles which should be grasped. Perhaps the central principle which would often be sufficient in itself was that the teacher should aim at getting the student to see that there was a question or problem to be solved. There should not necessarily be any attempt on the part of the teacher to completely solve the question, in fact it would be better not to try for any final conclusion. Leave it to the student to do some trying himself. Then, too, the teacher must be well informed on his subject, but he must avoid overloading the student with material, even though this might be of the best and most carefully arranged nature. Finally, teaching should be rehearsed beforehand, even to the extent of arranging for some form of climax in the presentation of the subject.

Prof. Clarke's address suffered only from the fact that due to limitations of time he compressed and shortened when his listeners would willingly have heard him at greater length. But as a teacher himself he knew very well the virtue of stopping when it was wished that he should go on. The freshness and authority of his address completed the satisfaction of an unusually pleasant and stimulating occasion.

Work has been begun on a million-dollar addition to the Western Branch of the Montreal General Hospital. This 10-storey annex, to be completed in the summer of 1932, will add 100 beds to the hospital's capacity and will permit advantageous rearrangement of many departments. J. Cecil McDougall is the architect and Anglin-Norcross, Limited, are the builders.

Dr. Herbert M. Little, of Montreal, was elected first vice-president of the American Association of Obstetricians, Gynæcologists, and Abdominal Surgeons at the 44th annual meeting of the society held in White Sulphur Springs, West Virginia, in September.

Dr. S. Hanford McKee, of Montreal, has been elected president of the American Academy of Ophthalmology and Otolaryngology, the annual meeting of which was held in September at French Lick, Ind.

Saskatchewan

At the November staff meeting of the Grey Nuns' Hospital two cases of sarcoma of the cæcum were presented by Doctor Roy and Doctor MacMillan. Doctor Roy's case was that of a boy who was operated on when he was sixteen. After operation he received heavy x-ray treatment and was in good health for five years; then a recurrence appeared, an operation was performed, but the patient died. The case reported by Doctor MacMillan was of a much shorter duration. The point of interest was that the sarcoma did not encircle the intestine but went up from the cæcum toward the hepatic flexure. Very few cases of sarcoma of the intestine have been reported. In only one of these cases was diagnosis confirmed by a pathological report. Doctor Hardy presented a case of brain abscess which originated in the orbit, causing much swelling in the eye, but later apparently drained into the brain, because when the end was near swelling disappeared from the eye.

The annual meeting of the staff of the Regina General Hospital was held on November 20th. An address was given by Miss Helen Smith, Superintendent of Nurses, on the economic situation of the private duty nurse. There are 65 graduates of the Regina General Hospital on call for private duty; there are about 17 calls a week for private duty nurses in the hospital, so that if the doctors would call the nurses in order, instead of asking for them by name as they sometimes do now, each nurse would have some work every three weeks. The staff very gladly accepted Miss Smith's suggestion. The staff also decided to establish a loan fund which nurses could use from time to time.

Dr. S. E. Moore and Dr. Lloyd Brown presented a case of aplastic anæmia in a child. There was no sign of any regeneration of the blood and the prognosis was bad. Officers elected for the new year were: *President*, Dr. Lillian A. Chase; *Vice-president*, Dr. W. A. Harvie, *Secretary*, Dr. Lloyd Brown; *Executive*, Drs. D. C. Hart and U. Gareau; members of the advisory committee to the Board of Governors, Drs. H. McLean and R. McAllister.

At the November clinical meeting of the staff of the Regina General Hospital Dr. F. J. Ellis gave a paper on "Symptoms of pre-eclampsia and eclampsia"; Dr. W. M. R. Palmer spoke on "Eye conditions in toxæmia of pregnancy", and Dr. W. A. Thomson gave an address on "Treatment of pre-eclampsia and eclampsia". Dr. E. T. French opened the discussion on these papers. Dr. George then presented a case to the meeting for diagnosis. A girl, aged 18, had lost about 35 pounds in six months; her menstruation had ceased, and she was constipated; all other physical, laboratory and x-ray investigations were negative. A lively discussion followed, many diagnoses were suggested but some objection was found to each one. The discussion of this case will be continued at the next meeting.

Dr. S. E. Moore has presented to the Regina General Hospital a picture of the late Dr. T. A. Morrison, who was a member of the staff of the hospital from 1916 until his death in 1931, and was chief surgeon to the R.C.M.P. from 1916 until his death. Dr. Moore, in presenting the picture, dwelt on the untiring work of Dr. Morrison, attending his patients by horse and buggy, by horse and cutter, by dog sled when he was in the north, and in his later years taking long car trips to wherever the force needed him. Commissioner Spalding, of the R.C.M.P., also spoke of the kindness of Dr. Morrison not only to the members of the force but to their families. Alderman McInnis accepted the picture on behalf of the Board of Governors.

The Lieutenant-Governor's Distress Fund has been organized throughout the province for relief purposes. It is estimated that 150,000 people in the province are on relief. It is to provide these people with medical assistance, nursing care, supplies and such assistance that government relief cannot possibly afford that this fund is being collected. In speaking of this topic at the Regina and District Medical Society, His Honour stated that he felt that there was plenty of money in the province if only the sympathy of the people who had it could be aroused and the need could be made known to them. He expressed the feeling of others as well as his own opinion when he said that great tales of hardship going to other countries and other provinces had spread the opinion that the West was down and out, which is far from the truth.

Physicians and dentists in the drouth area of Saskatchewan will be aided by the Relief Commission. The area has been divided into three districts according to the severity of the drouth. Those physicians in area "A" will receive a grant not exceeding $75 a month, and those in area "B" and "C" a grant not exceeding $40 a month. A grant of $25 will be paid to dentists in "A" area, and a grant of $15 will be provided for those in "B" and "C" areas. In addition to the present government grant the government will pay 50 cents per day per patient to all hospitals in "A" area for a period of five months, starting November 16. Hospitals in "B" and "C" areas will receive a grant of 25 cents per patient per day.

The relief commissioner pointed out that the commission cannot subscribe to the principle that the members of any profession should receive a bonus or honorarium, for all professions must be regarded as of very definite value to the state, but the medical and dental services must be carried on without interruption. In other words, doctors and dentists are of no more value to the state than lawyers or ministers but the people cannot live without them. Theoretically, one profession is doing as much good as another the commission believes, but practically they must act to please the people in the country who do not always understand theory as they should. LILLIAN A. CHASE

United States

The New York Psychoanalytic Institute.—The New York Psychoanalytic Institute located at 324 West 88th Street began operation on October 1, 1931. During the present winter its educational and scientific activities will be under the direction of Dr. Sandor Rado, of the Berlin Psychoanalytic Institute. Elementary and advanced seminars for practising psychoanalysts are being given. It is also planned to hold seminars for social service workers; a course of introductory lectures on psychoanalysis for physicians; and a series of lectures open to the public.

All inquiries in regard to these courses are to be addressed to the Executive Director, Dr. M. A. Meyer, at 324 West 86th Street, New York City.

The American Psychoanalytic Foundation was established with the object of fostering psychoanalytic education and science in America. The Foundation is incorporated in the State of New York and succeeds the Educational Trust Fund formed by the New York Psychoanalytic Society several years ago. The Board of Directors of the American Psychoanalytic Foundation are: Dr. A. A. Brill, Chairman; Mr. Leo S. Bing, Mr. Sam. A. Lewisohn, Dr. S. E. Jelliffe, Dr. C. P. Oberndorf, Secretary (112 West 59th Street, New York City). The Counsel of the Foundation is Mr. Alfred L. Rose.

Alvarenga Prize of the College of Physicians of Philadelphia.—The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Senor Alvarenga, and amounting to about three hundred dollars, will be made on July 14, 1932, provided that an essay deemed by the Committee of Award to be worthy of the Prize shall have been offered.

An essay intended for competition may be upon any subject in Medicine, but must be accompanied by a written assurance from the author that it has not appeared previously in print, either in whole or in part, in any form, and has not been presented elsewhere in competition for a prize. The essay should represent an addition to the knowledge and understanding of the subject based either upon original or literary research. It must be typewritten, and in English acceptable for publication without necessity for editing by the Committee. Any illustrations should be appropriate and correctly annotated with the text. Essays must be received by the Secretary of the College on or before May 1, 1932.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; and that it may be published by the author with the consent of the College; other essays will be returned upon application within three months after the award.

The Alvarenga Prize for 1931 has been awarded to Dr. Edgar S. J. King, Melbourne, Australia, for his essay entitled: "The nature of the stroma of the ovary."

John H. Girvin, Secretary, 19 South 22d Street, Philadelphia, Pa., U.S.A.

Appointment at Cornell University Medical School.—Dr. Eugene L. Opie, professor of pathology at the University of Pennsylvania School of Medicine, and Director of the laboratory of the Henry Phipps Institute, has been appointed professor of pathology at Cornell University Medical School to succeed Dr. James Ewing, who will retire in 1932 after thirty years in that position. Dr. Opie was a member of the National Board of Medical Examiners for five years serving in its department of pathology. Dr. Ewing plans, it is reported, to devote his entire time to the study of cancer and to his work as president of the medical board of Memorial Hospital.

Leroy Long, Dean of the School of Medicine, University of Oklahoma, resigned recently in protest to the fiat of the Governor that chiropractors be allowed to practise in the University Hospital.

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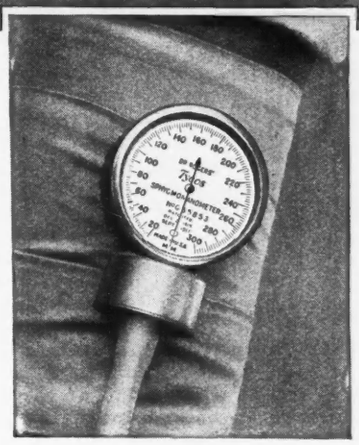

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General

Report of the Banting Research Foundation for the Year 1930-31.—The Banting Research Foundation, in accordance with Clause I of its Charter, devotes part of its income to the work carried on by the Banting and Best Chair of Medical Research in the University of Toronto. A report of the investigations assisted by the Foundation reveals the publication of the following papers: "Colorimetric determination of silica"; "Enzyme hydrolysis of lecithin"; "An investigation of leg-weakness in chickens," by E. J. King: also "Hypervitaminose bei Hühnern," a further series of six papers dealing with the effect of vitamins on the production and cure of certain diseases occurring in chickens, and the effect of diet on the production of rickets in chickens, by E. J. King.

Reports have been received from the following grantees who were supported by funds during this or the previous year:—

Dr. John McEachren, University of Manitoba. "A study of cholesterol metabolism." Two papers have already been presented by Dr. McEachren, in the first of which he has shown the effect of diet on the cholesterol content of the blood, and has apparently shown that it is without effect. He has called attention to the extraordinary variations that occur normally (see this issue of the *Journal*). In the second paper, he has presented evidence to show a lack of seasonal variation in blood cholesterol, and has followed the change in blood cholesterol during pregnancy.

Dr. A. C. Abbott, University of Manitoba, has reported the completion of an investigation of the formation of bone from transplanted pieces of urinary bladder. Doctor Abbott has also made considerable progress with an experimental study of Breitner's hypothesis of thyroid function.

Dr. A. M. Davidson, University of Manitoba, has reported on the identification of the fungi which cause skin diseases in man. He has also published a preliminary paper on the character of the fungus diseases occurring in Manitoba.

Prof. F. D. White, University of Manitoba, has a study of the bile pigments occurring in the blood stream and their quantitative estimation.

Dr. R. H. Fraser, University of Manitoba, has made a preliminary report on the isolation from the urine of tuberculous patients of the substance which produces the Barber-Oriel reaction.

Dr. F. Hartley Smith, of St. Boniface Hospital, St. Boniface, Man., has completed a study of the anæmia of pregnancy, showing its normal physiological progress.

Mr. P. G. Mar, Department of Histology, University of Manitoba, has made a preliminary report on a histological study of a case of inelastic skin.

Under Prof. J. C. Meakins, of McGill University, a group of workers has been studying glycogen metabolism. Mr. G. T. Evans has presented a very exhaustive study of the quantitative changes in glycogen in quantitative muscle, in the course of which he has greatly improved the technique for making such estimations, and has shown, amongst other things, that the glycogen content of the heart can be increased by the use of insulin and glucose; that muscular work does not necessarily decrease cardiac glycogen, whereas asphyxia and certain poisons greatly do so. Miss E. R. Grant has presented a preliminary report on the process of the recovery of glycogen following exercise. Initial and technical difficulties have been overcome, so that further study will undoubtedly produce valuable results. Mr. F. L. Horsfall, Jr., has reported on a study of the conversion of d-lactic acid into glycogen in the mammal. Again, a very heavy piece of work is approaching a satisfactory conclusion.

Mr. J. M. Hershey, working under Prof. Best in the Department of Physiology, University of Toronto, and associated with whom was Mr. S. Soskin of that Department, has reported the results of extraordinary experiments which show that the administration of lecithin to animals completely deprived of their pancreas is of undoubted value in regulating their metabolism and prevents the onset of the fatty changes in the liver and the death of the animals which are so apt to occur after this operation. The lecithin has both a preventive and a curative effect. The experiments throw a new and unexpected light on human metabolism.

Dr. C. M. Jephcott, of the Department of Physiology, University of Toronto, has reported on an exact technique for isolating insulin quantitatively from the pancreas, which will form the basis for a further study of tissue insulin.

Prof. H. A. Cates, of the Department of Anatomy, University of Toronto, reported on behalf of a Committee consisting of himself, Professor Hendry, of the Department of Obstetrics, Professor McIlwraith, of the Department of Anthropology, and Doctors Godwin and Irwin, on the results of studies of the head-form of parents and the new-born child, and of the pelvis of the mother, which at present indicates that the duration of labour and its difficulties are considerably increased when the parents are of different racial types, and that the disharmonies between head and pelvic form are of value in predicting the type of labour. A great deal of other valuable information has been obtained, and a series of reports from this Committee may be looked for in the future.

A small grant was made to Prof. V. J. Harding in connection with a study of the excretion of glucose by normal individuals, in which he has shown that the amount of the sugar may be influenced by the period of the day and the character of the preceding diet.

Mr. H. C. Graham, working under Professor Young, of Dalhousie University, submitted a report in which further progress in the study of the chemical forms of uric acid was made. This was undertaken in the hope of throwing some light on the excretion of uric acid by man and other species of animals.

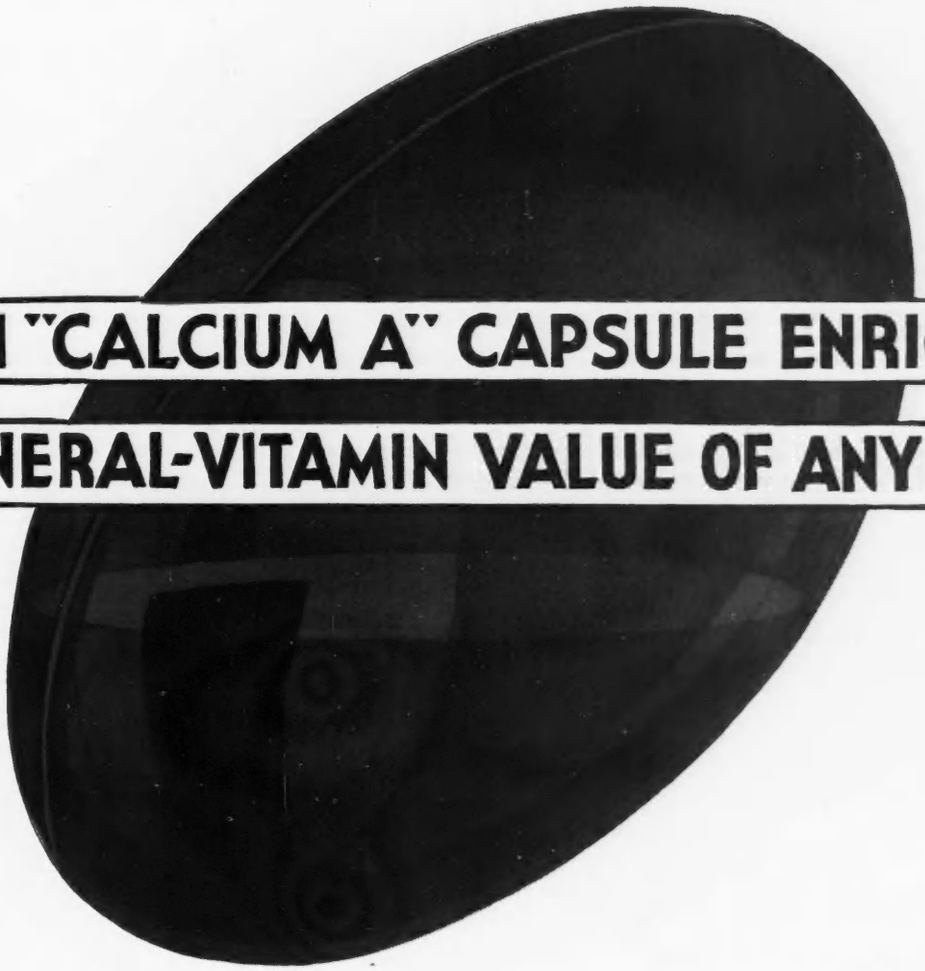
Dr. M. M. Cantor, working under Prof. G. Hunter in the University of Alberta, reported on the hormone derived from the adrenal cortex. This work is in a preliminary state, but certain of the early technical difficulties have been overcome and the ground laid for further progress.

Mr. S. Weinberg, working under Professor Manning, of the University of Saskatchewan, has submitted a preliminary report on the subject of the disintegration of adrenalin in the body. The work so far shows considerable progress.

A preliminary report has been received from Dr. R. Gottlieb, working in McGill University Clinic, on a research into the relation of certain liver cells to the production of bile and the occurrence of jaundice.

A report has been received from Mr. L. R. LeFave, working under Prof. J. Wyllie, of Queen's University, on certain types of agglutination occurring in normal innoculated enteric fever cases, in which the different types of agglutinins are distinguished, and the claim is made that the employment of an O-agglutinin may be of great value in the early diagnosis of typhoid fever. A preliminary report has also been submitted on an investigation of the non-lactose fermenting organisms in sewage, as occurring in the city of Kingston.

In all, the Banting Research Foundation has had a total of 16 persons working on long term grants and 11 persons working on shorter term grants, during the past year. As may be seen from the above, nearly all the English-speaking medical schools in Canada are represented in the reports received.



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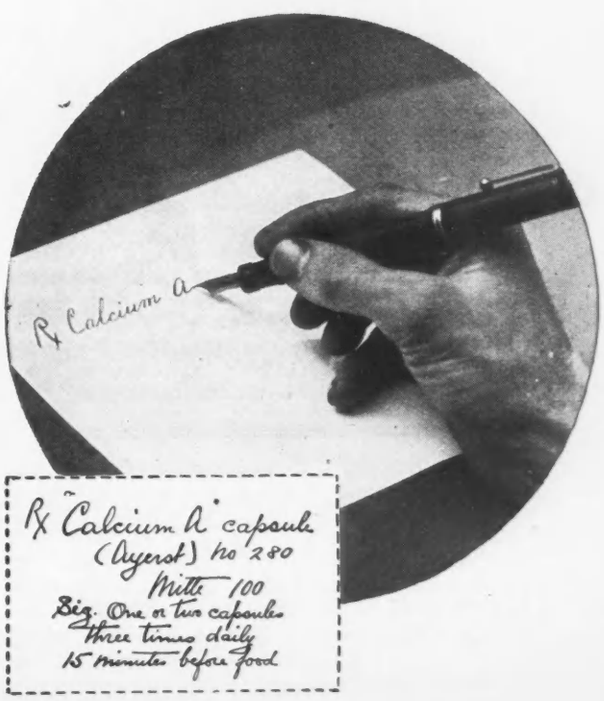

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A report is not included from the grantee working at the University of Western Ontario, Dr. J. W. Gilchrist, as his work had not progressed sufficiently to report thereon. This is true of a number of other workers. The work has been more widespread in character than in any previous year, and the quality of the investigations seems to be higher than many of those previously reported to the Trustees. The Foundation last year expended practically the whole of the income from its Capital Fund, and in consequence the Trustees are forced to choose carefully those problems which promise the most prospects of producing important results, though they are well aware that this entails certain dangers. Even the work which led to the discovery of insulin was considered by some well-informed persons as unlikely to be successful.

The Royal College of Physicians and Surgeons of Canada.—The second annual meeting of the Royal College of Physicians and Surgeons of Canada took place at Ottawa on November 19, 1931, with the President, Dr. J. C. Meakins, of Montreal, in the Chair.

The morning was occupied by a meeting of Council. Approximately one hundred and sixty Fellows were present for the annual meeting of the College in the afternoon. It was announced that His Majesty the King had graciously consented to be the Patron of the College, and a cablegram of good wishes was received from the Royal College of Physicians of London.

The Fellows and their wives were entertained in the evening by Their Excellencies, the Governor General and the Countess of Bessborough, at Rideau Hall.

The newly elected *President* of the College is Dr. F. N. G. Starr, of Toronto. Dr. W. T. Connell, of Kingston, becomes *Vice-president* in the Section of Medicine, and Dr. P. C. Dagneau, of Quebec, *Vice-president* in the Section of Surgery. Dr. T. C. Routley, of Toronto, continues as *Registrar-Secretary*.

The following were elected members of Council: Drs. J. C. Meakins, Montreal; Duncan Graham, Toronto; K. A. MacKenzie, Halifax; A. Rousseau, Quebec; J. E. Dubé, Montreal; A. T. Bazin, Montreal; N. J. Maclean, Winnipeg; E. L. Pope, Edmonton; A. R. Munroe, Edmonton; L. J. Austin, Kingston; Geo. C. Hale, London, Ont.; H. A. Farris, Saint John; A. H. Gordon, Montreal; Chas. Hunter, Winnipeg; J. G. FitzGerald, Toronto; R. E. McKechnie, Vancouver; W. Harvey Smith, Winnipeg; W. E. Gallie, Toronto; A. Primrose, Toronto; E. W. Archibald, Montreal; W. W. Chipman, Montreal.

The Royal Canadian Army Medical Corps.—The following transfers are authorized, with effect from the 1st November, 1931; Major J. A. Linton, M.C., from No. 6 Detachment, Halifax, N.S., to Camp Borden, Ont.; Capt. H. M. Cameron, from Camp Borden, Ont., to No. 2 Detachment, Toronto, Ont.; Capt. J. L. Sutherland, from No. 2 Detachment, Toronto, Ont., to No. 6 Detachment, Halifax, N.S.; Capt. K. A. Hunter, from No. 6 Detachment, Halifax, N.S., to No. 9 Detachment, Ottawa, Ont., and is detailed for duty at the Ottawa Air Station, Rockcliffe, Ont.; Lieut. J. V. A. Cavanagh, from No. 9 Detachment, Ottawa, Ont., (Ottawa Air Station, Rockcliffe, Ont.), to No. 6 Detachment, Halifax, N.S.

Knowledge and Wisdom, far from being one,
Have ofttimes no connection. Knowledge dwells
In heads replete with thoughts of other men;
Wisdom in minds attentive to their own.
Knowledge is proud that he has learned so much,
Wisdom is humble that he knows no more.

—William Cowper.

Book Reviews

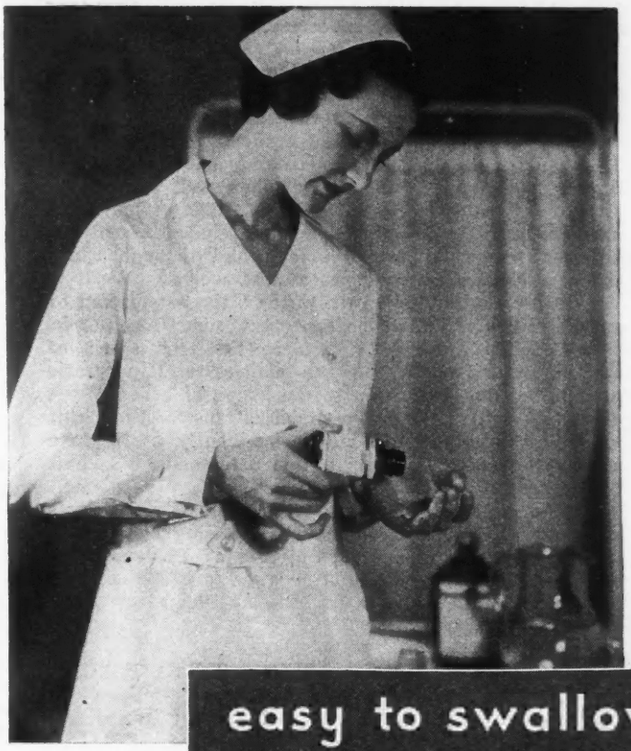
History of Medicine in the Province of Quebec. Maude E. Abbott, B.A., M.D. 97 pages, 42 illustrations. Price $3.00. Macmillan Co. of Canada, Toronto, 1931.

This outline of the history of medicine in the Province of Quebec was originally written for the publication known as "The Storied Province of Quebec," and has been reprinted, with additions and emendations, by permission of the Dominion Publishing Company, Limited, who issued that work.

It is a very pleasing little production, dealing with the history of medicine in the old French Province of Quebec from the time of Jacques Cartier's voyages until the present day. But it is much more than this; incidentally, it gives us an insight into the manners, customs, and social aspects of what is the most romantic and picturesque period of Canadian history. Indeed, it is not beside the truth to say that without a knowledge of the activities of medical men and nursing sisters, for these had many contacts and were far-reaching, it would be impossible to fully appreciate what the Province of Quebec, and Canada, were and what they became. We are carried back to a time when priests and nuns, soldiers and sailors, trappers and adventurers, saints and sinners, jostled elbows in the streets and market-places of Quebec, Montreal, and Three Rivers, and when two great nations were struggling for the ownership of half a continent. The book, then, is of interest not only to the medical profession, but can be read with advantage by all who wish to be well informed in regard to the history of their country.

The author has brought eminent talents to her task. She has long been recognized as an authority on the earlier medical history of the storied Province of Quebec. She has based the present work on her own earlier studies and on, in particular, the valuable productions of Drs. M. J. and G. Ahern, H. S. Birkett, J. J. Heagerty, and Arthur Vallée, and of Mr. E. Z. Massicotte and Miss M. R. Charlton. To this has been added some new and important material, notably, in regard to the care of the insane and the history of the Montreal Morgue. So that now, for the first time, we have a coherent and consecutive story, told in an easy but arresting way. A bibliography of sixty-one items testifies to the solid basis of the work.

Considerations of space prevent us from giving a detailed account of the many topics here presented; indeed, it would not be fair to the author to do so. The book must be read to be fully appreciated. But we may touch briefly on some of the matters presented. We have an informative section on medicine as practised among the aborigines, and learn with interest that their shahmans, or doctors, had to go through a prescribed course of study, just as we do now, though one not covering quite the same range of learning, and, further, that quacks and unqualified practitioners abounded, even as now. We learn of the position of French medicine in the seventeenth century; we hear again the romantic story of the rise of the early French hospitals, two of them earlier than anything of the kind in North America, save one, founded by Cortez in the City of Mexico in 1524. We get interesting details about the medical practitioners of the French period and the time of the British occupation. We learn of great epidemics; the beginnings and development of medical teaching; the rise of the medical schools; of medical journalism and medical societies; of medical licensure; of the care of the insane; of modern progressive movements for the well-being of society. It is interesting, too, to note the parallel that exists between the year 1816, which saw the birth of the Montreal General Hospital, and the year 1931. There was the same influx of the sick, the debilitated, and the poverty-stricken into the city of Montreal; by 1817 the depression was widespread for



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the crops had failed; and parliament had to come to the rescue. Just as to-day.

Doctor Abbott's book is illustrated by a number of well-chosen and informative pictures which carry out the spirit of the work effectively. A story of entrancing interest, well told, accurate, and authoritative, the "History of Medicine in the Province of Quebec" should be in every library.

The Great Physician—A Short Life of Sir William Osler. Edith Gittings Reid. 300 pages, illustrated. Price $3.50. Oxford University Press, London, New York and Toronto, 1931.

Those who were personally acquainted with Sir William Osler or who wish to become thoroughly informed as to the development of a great medical reform movement in Canada and the United States will, doubtless, prefer the larger and more comprehensive Life by Dr. Harvey Cushing. Nevertheless, Mrs. Reid has done us a distinct service in bringing out a more convenient account and one perhaps more suited for general reading. Her book is, indeed, very welcome.

"The Great Physician," the author tells us, is based above all on Doctor Cushing's notable work, but she has made use of Sir William's essays and addresses, as well as a large number of his letters, and has brought together some new material, notably in regard to Sir William's love of children. Ten new pictures, very pleasing, are introduced, particularly a very charming one of Osler's mother in her one hundred and first year. Mrs. Reid lived next door to the Oslers in Baltimore and knew them intimately, so that she has had exceptional advantages for the preparation of her work. We are informed about the Osler family and learn of the influences that were brought to bear on the future Sir William when in his formative years. We are taken through his college period, his sojourn in Montreal, Philadelphia, Baltimore, and Oxford, and we see him during the War and when he lay in his last sleep in Christchurch chapel close beside the memorial to his beloved Burton. We are conscious all through of an intimate, revealing, and sympathetic study.

But why, oh! why, has the proof-reader allowed so many irritating errors to mar the text of an otherwise charming story? We note "Birckett" for "Birkett" (page 247); "In absentio" (p. 287); "Edgerton" for "Egerton"; "little Wilhelmina" for "little Wilhelmine," and other lapses might be mentioned. On page 45 "Beaver Hill" should be Beaver Hall Hill," and "Radgonde" St. "Radegonde" St. This is venial, however, for only a resident of Montreal would know this. More serious is the statement on page 92 that the Universities in Philadelphia and Montreal were to some extent under political control. So far as Montreal is concerned the University referred to (McGill) has always congratulated itself that it was *not* under political control. It is hoped that if a new issue of the book is projected a thorough revision in regard to the points mentioned will be undertaken. It is a pity that so excellent a work should not be more nearly perfect.

In spite of all this, however, and these criticisms are intended to be helpful and are certainly not vital, we can recommend this delightful book. Sir William, as many of us knew him, lives again in Mrs. Reid's pages. We admire again his thoroughness, his many-sidedness, his human sympathy, his extraordinary influence on his associates, his broad culture, and his vision. Sir William Osler was well called "The Great Physician."

The History of Medicine. Bernard Dawson, M.D., F.R.C.S. 160 pages, illustrated. Price 7/6 net. H. K. Lewis & Co., London, 1931.

This charming little book is the outcome of an optional course of lectures delivered to the junior medical students of the University of Adelaide, S. Australia. Written in a lively and entertaining fashion, with a background of broad historical knowledge, it succeeds in presenting the main facts of the history of medicine from its origin in the dawning intelligence of primeval man to the highly specialized scientific levels of to-day in a succinct fashion. "All the students", writes Prof. H. Woollard in his Introduction, "attended all the time". "History", he adds, "when well told is the best of all stories", and in this little volume the sacrifices made to brevity have not excluded a sense of the great sweep of events among and through which modern scientific medicine was at last evolved. We have here, to use the author's own words "the summation of centuries of work of men often great, sometimes heroic, always sincere, whose devotion to the true spirit of scientific enquiry and to the view-point of the Hippocratic spirit raised our profession to the honourable position it has occupied from the earliest civilizations". From this standpoint therefore it should be eminently useful as a shorter student's text-book in this field, and as such it is to be warmly recommended.

The illustrations are reproduced chiefly from Osler's "Evolution of Modern Medicine" and Singer's "Short History" and there is a fine picture of Pasteur from Paget's "Experiments" and a good original picture from the Oxford University Museum statue of John Hunter.

Rest and Pain. Late John Hilton, F.R.S., F.R.C.S., Sometime President of the Royal College of Surgeons of England, etc. Edited by W. H. A. Jacobson, M.A., M.B., M.Ch. (Oxon.), F.R.C.S., Sometime Assistant Surgeon to Guy's Hospital. 514 pages, illustrated. Price $1.50. London: G. Bell & Sons; Toronto: Clarke, Irwin & Co., Ltd., 1930.

This book is the outcome of a series of lectures delivered at the Royal College of Surgeons of England in the years 1860, 1861, and 1862, and was first published in 1863. Its scope is indicated by its sub-title—"A Course of lectures on the Influence of Mechanical and Physiological Rest in the Treatment of Accidents and Surgical Diseases, and the Diagnostic Value of Pain." It is hard to find words to praise the work adequately. It was a classic immediately on its appearance and it has remained a classic ever since. Proof of its excellence is evidenced by the fact that it has been revised and reprinted no less than fourteen times. In spite of this, we fear that Hilton's *Rest and Pain* is merely a name, and perhaps not even that, to the majority of medical men of the present generation. That a book by a surgeon should have survived to the present year of Grace, for sixty-eight years, is a sufficiently remarkable fact, and is of itself a proof that Hilton's work was founded on everlasting principles. The time in which he lived might, not unjustly, be termed the age of meddlesome therapeutics. It needed someone of wide experience and established position to point out the better way. Hilton's merit is that he realized this, reasserted the *vis medicatrix naturæ*, and pointed out the diagnostic value of pain and the therapeutic value of rest. He did all this with a wealth of illustration derived from his surgical practice that makes his book interesting and instructive reading to-day. But there is more to be said than this. Hilton took the dry facts of anatomy and physiology and applied them in an illuminating way to the needs of daily practice; the close relationship of what we would now call the "basal sciences" to clinical work is everywhere emphasized. His book, while originally in intention a book by a surgeon for surgeons and surgical students, has an appeal for every medical man, no matter what his particular line of work. We may quote with advantage some of the author's closing words. "I have herein endeavoured to show that rest is a most important therapeutic agent in the cure of accidents and surgical diseases. To illustrate the varied applications of this principle, I first surveyed, as fully as my limits permitted, the marvellous contrivances which Nature has

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employed for securing Rest to the different organs of the body when in health. I then depicted the instinctive promptings of Nature to secure Rest on the occurrence of accident or disease. Lastly, I attempted to shadow forth the different appliances for the attainment of Rest with which that surgeon only will become familiar who has accurate knowledge of the anatomy and physiology of the different parts which he may be called upon to treat. I have also endeavoured to impress upon you the fact that every pain has its distinct and pregnant signification, if we will but carefully search for it.'' The principles which Hilton so ably and fully laid down two generations ago are as true to-day as they were then, and may be applied, it should be emphasized, to medical as well as surgical practice. Moreover, the literary style of his writing is a delight.

The editor, Mr. Jacobson, has done the profession a distinct service in bringing to our attention again a great book, after a period of ten years. By all means, buy this book.

The Practice of Medicine. A. A. Stevens, A.M., M.D., Professor of Applied Therapeutics in the University of Pennsylvania. Third edition. 1,150 pages, illustrated. Price $8.00. Philadelphia and London: W. B. Saunders; Toronto: McAinsh & Co., 1931.

This book ranks high as a standard text-book in medicine on the continent. By deleting much unnecessary and useless material, revising most of the chapters, and adding new chapters on the recent advances the author has brought the third edition of his work thoroughly up-to-date. As a safe guide to medical treatment it is highly recommended to student and practitioner.

Rheumatoid Arthritis and Its Treatment. Vincent Coates, M.C., M.A., M.D., M.R.C.P., Consulting Physician, Trowbridge and District Hospital, and Leo Delicati, L.M.S.S.A., Resident Medical Officer, Royal Mineral Water Hospital, Bath. 114 pages. Price 6/- net. H. K. Lewis, London, 1931.

This book deals largely with the treatment of rheumatoid artritis, and is based upon a series of one hundred consecutive cases of this disease admitted to the wards of the Royal Mineral Water Hospital. In the first chapters the authors discuss the classification of arthritis, the clinical features of rheumatoid arthritis and the various biochemical obliquities which are of diagnostic and prognostic importance. Subsequent chapters deal with systemic treatment of the disease. This is pursued along the lines of increased immunity, adjustment of clinical and biochemical abnormalities, and the elimination of infection and noxious products. A considerable place is rightly given to the methods by which joint deformities are prevented or cured. The final chapter is a summary of interesting clinical cases.

The authors do not take cognisance of recent relevant studies on the relation of the streptococcus to the etiology of the disease. It would seem that the studies of Cecil and his colleagues, and of Gray and Gowen, are worthy of consideration in a book devoted entirely to this subject.

Renal Lesion in Bright's Disease. Thomas Addis, Professor of Medicine, Stanford University, and Jean Oliver, Professor of Pathology, Long Island College of Medicine. 628 pages, illustrated. Price $16.00. Paul B. Hoeber, New York, 1931.

This monograph aims at the purpose set forth by Richard Bright himself, which was the study of renal disease ''by a reference to morbid anatomy,'' the phrase actually used by Bright in the subtitle of his famous ''Medical Cases''. It is no new thing to meet with exhaustive studies of kidney disease, but it is not often that we find one so rigidly confined to its clearly defined point of attack, namely, the renal lesion itself. The problem the authors have set themselves is that of determining ''the relation between observed changes in the urine during life, and the structural abnormalities found in the kidneys after death, exactly the problem set before us by Richard Bright.''

Such a plan might easily develop all the faults of extreme specialization, but this it has not been allowed to do. Rather does it stand as a fine example of how the very narrowest avenues of approach to a subject may be made to open out into widening and brightening vistas. On the clinical side, which was Professor Addis' care, the examination of the urine was the starting—and finishing—point; all else, no matter how interesting it was clinically, was left alone. But in Prof. Addis' careful hands the examination of the urine is a very different thing from the routine, even if thorough, methods of the ordinary clinician. What the urine contains, how and when it came to contain it, and what might modify the quantity of these contents, are the apparently simple questions he sets himself to answer. The chapter in which he gradually unfolds his methods should be read by every medical man. It is not that every one will be tempted, or will be able to copy them. As he says these methods were never intended for ''routine'' clinical work. ''At the present time 'routine' work means work done by someone else than the clinician, someone who has no knowledge of the patient or of the purposes for which the work is being done. The necessary degree of accuracy in the timing of urine and blood collections and the constant watchful care in the manipulations of the chemical work can come only from someone who has an immediate personal interest in the results. . . the clinician who is seriously interested in Bright's disease will not permit this work to be delegated to anyone else. It is the direct road to a knowledge of the renal lesion and it would be no more absurd for the heart specialist to employ someone to examine the precordium than for such a man to allow a 'routine laboratory' to report on urinary sediments. . . It is the picture as a whole which is suggestive, not the separate items, but the suggestion comes only to the man who knows the patient.''

Professor Oliver has confined himself to an objective description of the lesions observed. He has proved an ideal teammate, for in spite of temptations, even from his own co-worker, he has resolutely adhered to the scheme of simply observing the morphological changes accompanying the disease. As he puts it: ''Never before, to our knowledge, has the pathologist ever had clinical observations which lent themselves to correlation with his findings in any but a casual meaning of the word. The opportunity that presents itself is therefore unique, and in it lies the purpose and value of his work in the present investigation; he is to observe what he can, describe his observations as objectively as possible and not add confusion to the general aspect of the problem, from which alone a solution can ever come, by originalities of his own. The 'correlation' will then operate of itself, a result of the nature of the material at hand rather than of the art of the investigator—a humbler position than that often assumed by the pathologist, no doubt, but one which he may fill with sufficient dignity.'' And fill it he does, not only with dignity but with precision and lucidity. Magnificent microphotographs are used in amplification and illustration of the case reports, which by the way, are models of what case reports should be. He does, however, allow himself a most valuable and interesting chapter on pathological definitions.

The leisurely, scrupulously thorough, and patient atmosphere of this book is beyond praise. It is an example of the highest type of work in modern clinical medicine.

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Surgical Pathology of Prostatic Obstructions. Alexander Randall, M.A., M.D., Professor of Urology, University of Pennsylvania. 267 pages, illustrated. Price $7.00. William & Wilkins Co., Baltimore, Md., 1931.

The work is based on a study of 1,215 autopsies, with reference to the four frequent lesions of surgical importance, hypertrophy (*sic.*), median bar, carcinoma and abscess. It presents the gross morbid pathology of these lesions. As far as possible, the clinical picture has been correlated. In 312 instances of the 1,215 autopsies, gross pathological changes were found as follows: benign enlargement of the prostate 222; true fibrous median bar formation 57; carcinoma 17; prostatic abscess 16.

While the author has made careful studies of the cases as regards age incidence, racial occurrence, etc., the chief value of the work, in our opinion, lies in the excellent photographic full page reproductions of selected specimens, 78 in number, representing the various types of prostatic disease. Each plate is accompanied by a description of the specimen and correlative comments by the author on the clinical aspect of the case from which the specimen was derived. The illustrations are extremely good and give a comprehensive and adequate picture of the gross pathology of the prostate. In view of the involvement of the upper urinary tract by any obstructive lesion at the site of the prostate, and the important rôle it plays in such obstructions, we feel the work would have been improved by showing the upper urinary tracts of the cases selected for illustration. No microscopic studies are given. We are further not convinced that the author has made any serious effort to elucidate the pathogenesis of benign prostatic enlargement, which is a matter of so much interest and contrary opinions. Possibly, as he has expressly limited himself to the study of the gross pathology, this may be made the basis of a further study, which the richness of his available material warrants.

The publishers and printers have done their part in keeping the book up to the high standard set by the author.

Handbook of Skin Diseases. Frederick Gardner, M.D., B.Sc., F.R.C.S.E., F.R.S.E., Lecturer on Skin Diseases, University of Edinburgh, etc., Third Edition. 279 pages, illustrated. Price $3.50. Edinburgh: E. & S. Livingstone; Toronto: Macmillan Co. of Canada, 1931.

This small book is excellently designed for the needs of the graduate student and practitioner in medicine. The common skin diseases are given the proper proportion of space at the justifiable expense of the rarer conditions. Symptomatology and the discussion of differential diagnoses are clear and concise, and many of the photographic illustrations and coloured plates actually illustrate. A useful innovation is the depiction of characteristic histological changes by rough diagrams which really convey to the uninitiated a much better idea of the subject than the most elaborate microphotographs. The commonsense and attention to detail in the directions for management, especially in such conditions as the coccogenic infections, scabies, seborrhœa and acne, are very commendable. The broad viewpoint frequently displayed is exceptional to find in such a compressed work, yet lucidity has not been sacrificed. The remarks on etiology, pathological relationships, and therapy, under various headings, indicate a thoroughly up-to-date outlook. It may be remarked that the author's experience with thallium in ringworm appears to have been singularly happy, and he is hence inclined to minimize its dangers.

The reader, naturally looking first for the section on eczema, will look in vain. The avoidance of the term "eczema" seems almost ostentatious. The author's paraphrase of Osler's aphorism that angioneurotic œdema is only urticaria "writ large" is not happily applied to indicate the relationship of "eczema" and "dermatitis", since Osler had reference to morphology. Further, calling eczema "dermatitis" does not get away from the old problems of nomenclature and pathogenesis in this connection. This apart, the whole subject is most satisfactorily discussed. Infantile eczema is included by implication under the heading Seborrhœa.

Carbonic snow is extolled for vascular nævi, with no reference to radium, while radium in port-wine nævus is said to produce the "only curative results worthy of the name". It must be remarked that these views are diametrically opposed to those of dermatologists and radiologists in general.

A more useful handbook on skin diseases, which is thoroughly modern, could not be found to-day. With it at his elbow the worker in the field of general medicine will be well-equipped for recognizing and dealing with most of the skin conditions which he may encounter.

Simplified Diabetic Management. Joseph T. Beardwood, Jr., A.B., M.D., F.A.C.P., Chief of Diabetic Clinic and Associate Visiting Physician, and Herbert T. Kelly, M.D., A.A.C.P., Associate in Diabetic Clinic, Presbyterian Hospital in Philadelphia. 191 pages, illustrated. Price $2.00. J. B. Lippincott, Philadelphia, London and Montreal, 1931.

This little book offers a useful addition to the library of handbooks for the diabetic and his physician. Two new features are offered, *viz.*, a unit system for the computation of diabetic diets, and, secondly, suggestions and appropriate diets for use in the more common complications of diabetes. The unit system outlined is the so-called "line-ration scheme", which has been successfully used by the authors in both private and hospital practice. The system is clearly explained in the book and could readily be made applicable to the needs of any diabetic. The food tables, specimen diets, and recipes are adequate and suitable for use in the system described.

Criticism might be made of the stress laid on the complications of diabetes and their surgical treatment. This emphasis appears unwise in a book for patients, some of whom respond rather easily to suggestion.

A Manual of Embryology. J. Ernest Frazer, F.R.C.S., Eng., Professor of Anatomy in the University of London. 486 pages. Price 30/. Baillière, Tindall & Cox, London, 1931.

The traditional teaching of embryology in most medical schools is based on an analytical method whereby the development of each adult structure or system is followed from its primordium to the adult condition. To the embryologist it is a method which makes for completeness of detail; to the medical student it is a method which lacks the essential features which he requires in order to obtain a mental picture of the development of the regions he is dissecting, The reactions of growing parts on each other and their differential growth are factors which are either omitted or so sketchily dealt with in embryological works that a synthetic picture is impossible for the average student.

Professor Frazer has attempted this synthetic approach and has succeeded. Naturally it is a method which requires years of experience with *human* material, a clear concept of what is seen and not what is traditionally accepted, and a lucid style of exposition. To give clarity, Professor Frazer has had to omit much meticulous detail and be content by drawing his picture with the bold strokes of an impressionist. Here and there the omission of details is very conspicuous, but if references to work on such points had been given at the end of each chapter the book would be much more useful to the advanced student. References are few. The author in his preface points out that where no reference is given he accepts the re-

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sponsibility for any statement or interpretation. It is a modest way of declaring the originality of the work. The text-figures have been drawn by the author from reconstructions made by himself. They are clearly drawn and free from irrelevant detail. The average student will gain much by reading this book as he carries on his anatomical dissections; the advanced student will find a refreshingly new point of view, while the surgeon and physician will find it much easier to understand anomalous conditions and defects of development. One cannot but have the greatest admiration for an author who with twenty-five years of experience in this field is able to produce a text-book which is clearly written, free from boring detail, and tinctured with a gentle dogmatism which leaves clear-cut impressions on a student's mind.

Manual of Human Physiology. Sir Leonard Hill, M.B., LL.D., F.R.S., Hon. A.R.I.A. Third Edition. 464 pages, illustrated. Price 6/6 net. Edward Arnold & Co., London, 1931.

The third edition of this well known work conforms to the general style and context of its predecessors, being altered only as required to revise the data and to incorporate the recent additions of our physiological knowledge. This very readable volume of nearly five hundred pages has been written expressly for the general reader whose scientific education is limited but who desires a better knowledge of the processes of life. The general public is taking a greater interest than ever before in the problems of health and, at a time when pseudo-interpreters of physiological and pathological processes are leading the public astray, a new edition of this very sound work published by such an eminent authority is welcomed by the medical profession. In this work Sir Leonard Hill has avoided controversial theories and has endeavoured to give in as simple a fashion as possible the story of the wonderful complexity of structure and function which taken together compose the living man.

This book can be heartily recommended to the general public and would be a suitable text-book for high school students taking teachers' or other courses, and for undergraduate nurses.

The Significance of Waterborne Typhoid Fever Outbreaks, 1920-1930. Abel Wolman and Arthur E. Gorman, with a foreword by Thomas Parran, Jr., M.D., Commissioner of Health, State of New York. 82 pages. Price $2.00. Williams & Wilkins Co., Baltimore, 1931.

The object of this little book is to disclose some of the failures in the administrative prevention of water-borne typhoid fever in the past decade. This period is selected because it represents a time during which the most scientific and effective methods for providing safe water supplies have been developed. The authors have succeeded in doing this in a very striking manner, at the same time pointing out that, notwithstanding the almost perfect preventive measures available, the three largest epidemics of typhoid ever recorded occurred within these years. Although the death rate from typhoid fever declined from 25.8 in 1900 to 4.9 in 1930, per 100,000 population, there were, in the United States and Canada, 282 outbreaks with 12,203 cases of and 775 deaths from the disease. The majority of these outbreaks occurred in the smaller towns, as expected, but two severe epidemics developed in cities having a population of over one million. The principal causes of these outbreaks were untreated surface and underground waters, inadequate control of filtration and chlorination, and unprotected cross-connections. Undoubtedly, the outstanding facts brought out in this study are, first, that water-borne typhoid, in the past decade, has been due as much to "laxity in handling water from its source to the consumer as to the use of water from polluted sources," and, secondly, that unprotected cross-connections are a major cause of water-borne typhoid fever. It is disappointing and tragic to note that *inadequate chlorination* during the period was responsible for 985 cases of typhoid fever, and *interrupted chlorination* for 594 cases. A reference is made to, and examples given of cases in which the courts have allowed damages against cities and private companies for illness and death due to infected public water supplies.

The reading of this book confirms one's opinion that practically all public water supplies, to be made safe, require effective and efficient chlorination, whether or not preceded by filtration, and that most rigid supervision and control are needed.

A very useful and instructive book, especially for the sanitary engineer and health officer.

Contraception. Marie Carmichael Stopes, Doctor of Science, London, etc. 488 pages. Price 15/- net. G. P. Putnam's Sons, London, 1931.

This, the third edition of a much discussed book, contains many interesting facts dealing with the problem of contraception, its history, and the principles of its practice. The author is as one viewing a battle field where she herself has played no unimportant part, which the reader is at no time allowed to forget. There is, however, a wealth of information for the lay reader, and the average physician, particularly now that the pound has depreciated.

Athletics in Education. Jesse F. Williams, M.D., Professor of Physical Education, Teachers College, Columbia University; and William L. Hughes, A.M., Professor of Physical Education, DePauw University. 414 pages, illustrated. Price $3.00. London and Philadelphia: W. B. Saunders; Toronto: McAinsh & Co., 1930.

We have read this book with much interest, and can recommend it to the attention of all interested in the development of athletics as an educational measure in institutions of learning. Interest in its statements has been increased since we read in the public press that 31 fatal accidents have taken place in the United States during the past year amongst students engaged in the game of football. The writers discuss the many difficult problems connected with scholastic athletics, emphasize the importance of educational ideals and point out the necessity that athletics should be properly conducted and prove a source of physical, mental and mortal advancements.

With the entrance of commercialism into athletics and the development of the motto "Anything to win," the influence of sport has become more or less demoralizing.

The first section of five chapters deals with the history, place and supervision of athletics in education. The second section contains ten chapters and gives concrete and practical suggestions on the conduct of physical training; methods of finances are discussed, and directions are given for the organization and for the conduct of intercollegiate games and contests of all kinds.

The statement is made that no professionalism of any kind in university athletics is justifiable. The pressure of alumni desirous of having a winning team and the lure associated with the championship are not regarded as desirable. The chief aim of intercollegiate and intramural sport should be to develop wholesome recreation, mental and physical stimulation, and a generous and courteous reaction to opponents. A.D.B.

BOOK RECEIVED

A Clinical Study of Addison's Disease. Leonard G. Rowntree, M.D., and Albert M. Snell, M.D., Division of Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minn. 317 pages, illustrated. Price $4.50. Philadelphia and London: W. B. Saunders; Toronto: McAinsh & Co., 1931.